NOVEMBER 6, 1995 VOLUME 12, NUMBER 45

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Notes 4.0 to hop on the Internet freeway with a new navigation system. Page 10.

PeopleSoft stung by security glitches

By Barb Cole
Pleasanton, Calif.

The No. 3 client/server vendor PeopleSoft, Inc. is battling the same problem that has hit Netscape and others: Its existing security schemes are just too easy to crack.

In PeopleSoft's case, a window is left open because passwords are not encrypted over the network, allowing intruders to use software utilities to sniff them out and gain network access.

In addition, a master identification, which provides advanced network privileges, was stored on Windows clients in memory where it could be unearthed by hackers.

Stung by these discoveries, PeopleSoft last week shipped a patch to solve the ID problem, but the unencrypted passwords remain.

To foil intruders looking for unencrypted passwords, PeopleSoft will embed an interface that links its applications to Open Horizon, Inc.'s Connec-

See **PeopleSoft,** *page 76*

SECURITY PRECAUTIONS

PeopleSoft 5.0 problems...	...and fixes
Passwords are stored on users' desktops in Windows memory.	PeopleTools Version 5.01, which shipped last week, destroys user passwords shortly after logons are verified.
Applications cannot take advantage of all the security features in the databases with which they work.	PeopleSoft says it has now implemented enough security checks so leveraging all database security features is not an issue.
Passwords are passed over the network unencrypted.	PeopleSoft will include a link to Open Horizons middleware that encrypts any communication across the net.

Cisco falls short

Critics chastise router/switch vendor for its limited and confusing RMON strategy, a plan that lags rivals'.

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc.'s plan to add Remote Monitoring (RMON) management capabilities to some of its products falls far short of customers' needs and competitors' comprehensive initiatives.

3Com drapes RMON across its eclectic product line. **See story, page 27.**

Through an extension of its relationship with Frontier Software Development, Inc., Cisco last week said it will add RMON and RMON2-like agents to its Catalyst 5000 multiple-media and 1600 token-ring switches, and resell Frontier's NetScout probes and management applications. The Catalyst 1200 Ethernet and FDDI switch already has embedded RMON from a previous arrangement between Cisco and Frontier, and will have RMON2 next year.

Conspicuously absent from Cisco's RMON initiative, however, are RMON capabilities for its bread-and-butter routers, Grand Junction switches and LightStream ATM switches. Cisco must also reconcile the RMON implementation of its Catalyst 3000 (formerly Kalpana) Ethernet switches — which use agents, probes and applications from Axon Networks, Inc. — with that of the other Catalyst switches.

The different RMON implementations could raise sticky interoperability issues for customers.

"I haven't had very good luck with interoperability between RMON vendors," said Donald Varey, senior network specialist

See **Cisco,** *page 75*

There's a wide road ahead for narrowband ATM services

By Tim Greene

The ivory-tower debates about whether anybody really needs narrowband Asynchronous Transfer Mode are over: Except for a few holdouts, vendors and carriers are willing to gamble that T-1 ATM will sell.

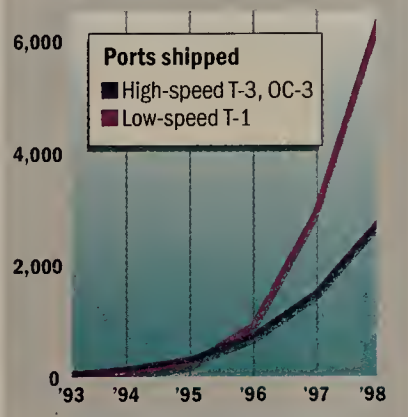
Encouraged by pricing that competes with frame relay, users want the service now, and vendors are getting ready to give them what they want. By this time next year, T-1 ATM should be available in most regions of the country.

Of the regional Bell operating companies, Ameritech Corp., Bell Atlantic Corp. and SBC Communications, Inc. already offer T-1 ATM service on

See **ATM,** *page 76*

ATM MART MOVING AT T-1 SPEED

Low-speed ATM is expected to be a major market driver over the next three years based on ports shipped.



SOURCE: VERTICAL SYSTEMS GROUP, OEOHAM, MASS.

Find more ATM resources on-line at http://www.nwfusion.com. From the main menu, select News+ then Front Page.

3Com taken with token-ring switch mart

By Michael Csenger
Santa Clara, Calif.

3Com Corp., squashing speculation that it might buy its way into the token-ring switching market, next week will unveil a homegrown workgroup switch and reveal plans for a future backbone switch.

Sources said 3Com will introduce the LinkSwitch-TR, a switch for token-ring users that is comparable to the company's LinkSwitch 1000 switch for Ethernet workgroups. It is expected to support about a dozen token

See **3Com,** *page 75*

PENTIUM PRO PREMIERES

Speed: The base Pentium Pro is 16 times faster than the fastest Pentium chip.

Cache: More cache is included in the chip, allowing for better performance.

Server vendor support: AST, Compaq, HP, NetFrame, Tricord and others.

For a story on how the Pentium Pro will affect your network and a roundup of servers based on the chip, see page 14.

In-Site

Distributed MCI app feather in DCE cap

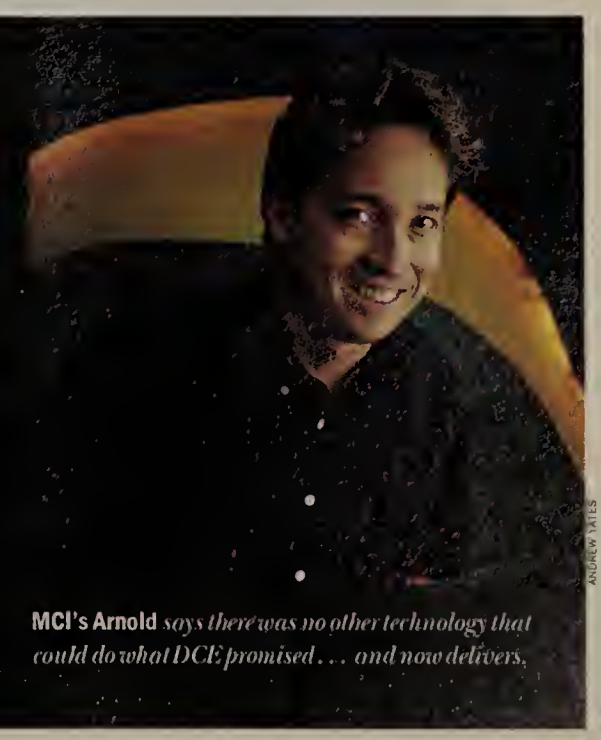
By Michael Cooney
Austin, Texas

When it came to keeping the customer satisfied, MCI Communications Corp. chose DCE.

The carrier recently completed a distributed application project that links more than 5,000 end users at 10 U.S. customer service centers, making it one of the largest Distributed Computing Environment network "cells" in the country.

"In the past, all of our centers operated indepen-

See **MCI,** *page 75*



MCI's Arnold *says there was no other technology that could do what DCE promised . . . and now delivers.*

ANDREW YATES

Access Network World Fusion using the number in yellow. See page 5 for details.

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This Week

News+

The Front Page:

Download RMON MIBs and a paper on the RMON issues facing network managers.

Find out how vendors are securing client/server applications.

The Technical Sections:

A Network World Fusion special! In exclusive Q&A's, Microsoft executives tell how they'll prove the company is serious about enterprise networking. In Local Networks.

Industry Watch: Curt Monash wonders how Robert Heinlein would write a guide to computer marketing.

Forum

Your side: A trucking company installs monitoring devices in its vehicles that keep detailed records on its employees' habits. How closely should companies monitor workers? Talk about it in nwfusion.talk. Select "Employee monitoring."

NetRef

Technology Resources: Worried that you're missing the boat on ATM? Study up with the resources we've pulled together.

Professional Development: New seminars
DirectConnect: Download demo software
Network World Central: Get in touch with us

this week's pick

If you want to learn more about objects and distributed computing, a good place to start is Los Alamos National Laboratory's Sunrise project page, where you'll find plenty of primers and links. Start at http://www.acl.lanl.gov/sunrise/apps-ets.html.

HOW TO GET ON TO NETWORK WORLD FUSION

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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, November 6, 1995

Apple carts out new server tools

Apple Computer, Inc. last week began bundling virus protection, asset management, fax support and network analysis software with its line of PowerPC Workgroup Servers. The Cupertino, Calif., computer vendor also added Adobe Systems, Inc.'s PageMill World-Wide Web page authoring tool to its selection of Web page construction products that make up Apple's Internet Server Solution.

In store from EMC

EMC Corp. this week will announce products and services to provide mainframe-class storage facilities for client/server LAN environments. The EMC Symmetrix 5000 Enterprise Storage Platform will be enhanced to include simultaneous support for mainframe and heterogeneous PC- and Unix-based LAN servers. Previously, the product only supported mainframe storage. The company also announced a consulting service to help users migrate from mainframe storage facilities to client/server ones.

Pricing information was not released.

2000: A computer odyssey

IBM last week said that if users have not already started planning for how their systems will respond to the year 2000, it may be too late. For years, business software has represented years using only two digits, such as 95 rather than 1995. This will create tremendous problems when the millennium hits, especially in applications that make monetary forecasts.

To help, IBM is offering a document titled "The Year 2000 and Two-Digit Dates: A Guide for Planning and Introduction" on the World-Wide Web at http://www.software.ibm.com. The firm will also offer software tools and consulting services.

Power shift at the FCC

President Clinton last week named Kathleen Wallman, chief of the Common Carrier Bureau at the Federal Communications Commission, as the new White House deputy general counsel. Wallman will be replaced by Regina Keeney, current Wireless Bureau chief, best known for running the FCC's auctions of wireless personal communications services licenses.

Oracle, AT&T gang up on the 'Net

Technology powerhouses Oracle Corp. and AT&T last week said they will soon begin jointly selling Oracle's Web-enabled database tools and AT&T's WorldNet Internet access services. The idea is to give companies software tools to create interactive Web sites and high-speed, secure connections of those sites to the Internet, an AT&T company spokesman said.

IBM spruces up gateway

IBM last week said it has added new TCP/IP routing capabilities to its 3172 channel-attached LAN-to-mainframe gateway. The 3172 IP Channel Communications Program Version 1 software lets the box route TCP/IP data from Token-Ring, Ethernet, FDDI or, in the future, Asynchronous Transfer Mode LANs, to applications on the mainframe. The software supports the Routing Information Protocol and can communicate with as many as 16 mainframes linked via IBM's fiber-based Enterprise Systems Connection channels.

The software will be available Nov. 17. Pricing was not announced.

But it's only a beta release

NetWare support newsgroups are starting to heat up with users complaining about problems involving the just-released NetWare Client32 for Windows 95, the first client code from Novell, Inc. specifically supporting Windows 95.

The problems are typical of most beta releases: some hardware incompatibility, some configuration problems, unexplained crashes and workstations freezing up. Despite the beta bugs, most users seemed fairly happy with the speed of the client and its support for Windows 95.

Banyan piles on the products

Company should have its hands full delivering full slate of integration offerings.

By Peggy Watt
San Jose, Calif.

Banyan Systems, Inc. last week described an ambitious slate of new products, ranging from StreetTalk integration with non-VINES servers to a new desktop-based application launcher.

The plans were met by a user and analyst community that hopes the company can deliver in a timely manner but also fears that the Westborough, Mass., net operating system vendor is stretching its resources too thin.

Banyan executives speaking at the semiannual Association of Banyan Users International conference here promised to deliver by mid-1996.

- New versions of Enterprise Network Services on Hewlett-Packard Co.'s HP-UX 10 and Siemens Nixdorf Information Systems, Inc. Unix.
- A StreetTalk-based application launcher, called Click to Application.
- Client access to Unix- and Microsoft Corp. Windows NT-based file and print services from VINES clients.

The ENS products are a set of VINES services, including directory and messaging, that Banyan has ported to run on other operating systems using those systems' file and print services.

Ed Cloutier, Banyan's vice president of strategic relations, cited "the Windows NT effect" — the growing influx and influence of NT servers, which prompted Banyan to find more ways to integrate NT with VINES and to eventually implement StreetTalk on Windows NT.

Banyan already supports NT as a VINES desktop through the VINES IP. Cloutier calls the latest initiative "StreetTalk-enabling" resources on NT and Unix servers. Windows NT re-sources will appear in the desktop StreetTalk, but users do not have to worry about Windows NT's domains.

Banyan's determination to accommodate Windows NT is well founded, users said.

"Integrating Windows NT is a big issue. I'd like to see it soon," said Rick Ulmer, access network computing consultant with Bell Canada, Ltd., which maintains a network of 450 VINES servers and more than 40,000 clients. And he believes the company can deliver. "I think Banyan's pretty much there," Ulmer said.

All the products are in development except Click to Applications, which is still in design, Cloutier said.

"A lot of these new products build on technology we already have," said Donna Angiulo, vice president and general manager of Banyan's directory solutions business unit.

Some questioned the wisdom of Banyan's decision to freeze development of ENS for SCO Unix, the largest supplier of Intel-based Unix. Banyan will still support the product, initially released in late 1992 but will not revamp it to run on updates to SCO Unix beyond Version 4.2, Cloutier said. Users can obtain more copies of ENS for SCO and swap to a license for ENS for another Unix version, he added.■

Was that DB2 on Windows NT?

By John Cox
Somers, N.Y.

Say "DB2 on Windows NT." Then think about what you said.

That's what IBM said last week when it revealed plans to ship on November 11 the client/server version of its relational database manager on Microsoft Corp.'s fast-rising server operating system. IBM officials insisted the product will deliver a level of reliability, cross-platform data integration and scalability not possible with Microsoft SQL Server on NT.

"I put this in the 'About time and wow!' category," said Don DePalma, with Forrester Research.

"At one level, this is a 'Who cares?' thing because we expect Microsoft NT in two years to have about 40% of new server shipments, with a corresponding share for SQL Server," said Don DePalma, director of the software strategy service at Forrester Research, Inc. in Cambridge, Mass. "But IBM is making a fundamental about-face on the Windows technology. I put this in the 'About time and wow!' category."

The client/server version of DB2 now runs on OS/2, AIX and HP-UX computers. The product's code base is different from the original mainframe DB2 product, although the two versions share a common SQL across all operating systems and common connectivity software.

IBM's Tim Negris, vice president of sales and marketing, Software Solutions Division, said IBM will integrate DB2 on NT with Lotus Development Corp.'s Notes and the Lotus SmartSuite desktop applications. IBM also plans to use the Lotus Approach PC database — which now has about 2 million users, according to the company — to let end users easily access DB2 data.

That will be a compelling picture, for some users at least. "For IBM's dyed-in-the-wool Big Blue downsizing customers, this [product] is right down the middle of the plate," DePalma said.

IBM separated the DB2 base code from the level at which users and applications interact with the database. As a result, IBM officials said, DB2 can exploit unique features of NT, such as its threading model. But DePalma said Microsoft publishes the NT interface and "everyone is doing this" exploitation.

IBM's biggest challenge, he added, is not exploiting NT but the distribution channels — the value-added resellers and systems integrators, many of whom are working with the Microsoft NT-based BackOffice applications, including SQL Server.

©IBM: (800) 426-2255.

A FRIEND IN NEED...

Network World Fusion conferences (http://www.nwfusion.com)

Question of the week: The administrator of a 5,000-user E-mail net isn't happy with the company's current messaging software and wants help finding a new package. What do you recommend — and what do your virtual colleagues think? From the Forum menu, select conferences, Help Desk, then Topic 21 — "E-mail: LAN based and Mobile."

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Novell looks to snare users in the Web

Offers users tools for bundling NetWare-based Web servers.

By Kevin Fogarty
Boston

Novell, Inc. last week announced at Internet World the first phase of a plan to make the World-Wide Web an alternative entry point to NetWare networks.

The NetWare 4.1-based Web server will initially provide an easy way to build an internal or public Web site that supports the security technology found in NetWare Directory Services (NDS). Later versions will let companies set up a secure way to give end users, including those surfing in from remote sites, access into NetWare servers via a Web browser.

WEB SECURITY

Novell plans to add three layers of security to its Web server:

- **Secure Sockets Layer:** Netscape security protocol running under HTTP that adds data encryption, server authentication and secure messaging to a TCP/IP connection.
- **Secure HyperText Transfer Protocol:** Enterprise Integration Technologies' protocol that adds message-level security on top of HTTP.
- **Secure Containers:** A method of wrapping a file in an envelope of security and rules that govern how and by whom the file can be used. The envelope remains with the file no matter how many hands it passes through.

The product, which will initially run on TCP/IP nets, was expected to support IPX networks out of the gate. But Novell will not complete its IPX gateway until early next year, so company officials decided to ship a single-protocol version.

Most of the code in the NetWare Web server is licensed from American Internet Corp. (AIC), which last week released its own version of the product, dubbed SiteBuilder.

Novell's version supports the BASIC and PERL programming languages, while SiteBuilder supports only BASIC. But SiteBuilder ships with an IPX gateway and runs on NetWare 3.X.

A key feature of both products is Remote Common Gateway Interface (RCGI), an extension to the Web CGI development language that opens a gateway to other operating systems, said Vic Langford, vice president and general manager for Novell's Internet Commerce Division. Using RCGI, Webmasters can put calls in Web pages for passing off data requests to applications running on SunSoft, Inc.'s Solaris and SunOS, as well as The Santa Cruz Operation, Inc.'s UnixWare.

Future versions of Novell's Web server will let users access their networks securely across the Internet by adding support for Web security protocols to the server (see graphic).

The plan is to make documents stored on NetWare servers accessible through the Web while controlling access to them using NetWare security, said Tim Sloan, an analyst at the Aberdeen Group, Inc. consultancy in Boston. Rather than having to duplicate files onto the Web server, Novell's plan is to leave files on user's home servers and let the Web server use NDS to find them, he said.

Even without higher levels of security, the first version of the Web server is easy enough to use and versatile enough to make it worthwhile, said John Dubiel, manager of planning and technology at Boston Edison Co., which is beta-testing SiteBuilder. Installation took about 5 minutes and the server has not hiccuped since, he said.

The RCGI capability also looks attractive because it makes NetWare servers more useful as entry points to back-end databases running on Unix or other operating systems, Dubiel said.

The NetWare Web server is due to ship Dec. 21 for $995. AIC's SiteBuilder will also be available in December for $1,495, which includes a Web-building package and IP Access, a server-based dynamic IP addressing module.

✆AIC: (800) 425-1112; Novell: (800) 638-9273.

CORRECTION

Information in the table for the review "Ready, Set, Go Remote" (Oct. 16, page 41) was incorrect. The Xylogics Remote Annex 4000 supports, in addition to the boxes checked, AppleTalk, SLIP, CSLIP, PPP, PPP with PAP, PPP with CHAP, a dialer, a port redirector, as well as SecurID, Kerberos and Enigma security options. The Emulex ConnectPro Plus also works with SecurID.

Component software

Novell hands IBM the job of porting OpenDoc to Windows

By John Cox
Somers, N.Y.

IBM last week said it is taking on the work of porting the OpenDoc component technology to Microsoft Windows.

The decision dispels some of the uncertainty that has clouded the OpenDoc project for the last few months as the original developer, Novell, Inc., reviewed whether OpenDoc fit with its new corporate strategy. But IBM faces an uphill battle to win a space for OpenDoc on Windows 95 and Windows NT desktops and in third-party applications.

The decision also means a delay in bringing OpenDoc to Windows. Novell had already released several well-received beta versions of the OpenDoc software developers' kit (SDK) and planned the commercial release around year-end. Release 2, which was due later in 1996, would let OpenDoc parts interact over the net. Now IBM plans to release a beta version of the OpenDoc SDK by June 1996 and the final product by September.

OpenDoc comprises an API, libraries and utilities based on IBM's System Object Model (SOM). With OpenDoc, software developers can create components, called parts, that can be shared and reassembled into larger applications. OpenDoc was created by Component Integration Laboratories, Inc., which is jointly funded by Apple Computer, Inc., IBM and Novell through the latter's acquisition of WordPerfect Corp. The sponsors have been porting OpenDoc to their respective operating systems.

IBM has been contacting beta users of the Windows OpenDoc SDK, talking with third-party application developers, and is planning to accelerate its OpenDoc evangelization work, technical conferences and training.

IBM has submitted OpenDoc to the Object Management Group for acceptance as an industry standard, based on OMG's Common Object Request Broker Architecture (CORBA).

"IBM [now] can take the high road and tell customers, 'Regardless of what object model you choose, you can use OpenDoc to build components for OLE or CORBA environments,' " said Don DePalma, director of software strategy services at Forrester Research, Inc. in Cambridge, Mass.

Although OpenDoc is still in beta, it is demonstrating capabilities not found in OLE. Developers today can build OpenDoc parts, which are compatible with the SOM object model; run these on separate AIX, OS/2 and Windows 3.1 computers; and have the parts interact as if they were on one machine.

Microsoft has yet to release even a spec for Network OLE, which is intended to let OLE objects run over a net. The firm is expected to announce the spec soon, but implementations are one to three years away. ■

- A white paper describing the philosophy behind OpenDoc
- One Apple engineer's impassioned plea to support OpenDoc as a way to stop Microsoft
- A look at software for OpenDoc/OLE interoperability

To access: Point your Web browser at http://www.nwfusion.com. Select News+ then Client/Server Applications.

World Fusion

Novell slaps For Sale sign on application suite

By Kevin Fogarty
Provo, Utah

The status of a Novell, Inc.'s application suite that was to have been tightly integrated with NetWare was thrown into question last week as the NOS vendor announced that it is bailing out of the suites market.

No one knows who will pick up the desktop office suite Novell slapped a For Sale sign on last week, and, as a result, no one knows if future versions will have any network hooks at all.

Also uncertain is the fate of the integration code called PerfectFit. While Novell could theoretically use it to link NetWare with Microsoft Corp.'s Office and Lotus Development Corp.'s SmartSuite, the firm has not yet made any decisions, said Jeffrey Waxman, executive vice president and general manager of the Novell Applications Group.

Novell will keep the right to use PerfectFit to link Novell products such as the GroupWise electronic mail package more tightly to NetWare, but those plans are also incomplete, he said.

"Within Novell, we obviously want to use it to integrate our own products," Waxman said. "We would probably maintain a relationship with the buyer, but we want to be out of the applications business entirely."

Talks are on

Novell officials said the company is negotiating with two unnamed parties to sell its Business Applications Group, which includes the PerfectOffice suite of WordPerfect, InfoCentral, Presentations and Quattro Pro.

Novell is not only selling off the shipping versions of the products, which include some hooks to NetWare, but it is also dumping the networked versions of those products currently being developed. Partially completed products include a client/server version of PerfectOffice and a network-enabled version of the suite, code-named Aspen, Waxman said.

Novell is shedding the unit to focus on its core networking business. In an E-mail message to reporters, Novell Senior Vice President for Corporate Marketing Christine Hughes called the PerfectOffice sale "the last in a series of actions to implement our strategy to refocus our business on networking."

Novell will hold on to GroupWise and the applications that integrate with it: the SoftSolutions document management application, the Envoy document viewer and the InForms electronic forms package. ■

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Tool cleans up data warehousing apps

By Barb Cole
Menlo Park, Calif.

A start-up company here is developing software aimed at making large data warehousing applications run more efficiently across corporate nets.

Sagent Technology, Inc. is readying a decision-support tool that does the bulk of its query processing on a server, minimizing the amount of data passed back to client computers for processing.

Decision-support tools are typically client-based applications used to tap into central storehouses of information known as data warehouses. While these tools are helpful for retrieving data, usually in a workgroup setting, heavy use of them across the enterprise can bog down network performance.

As a result, a new crop of decision-support tools similar to those developed by Sagent are emerging that support enterprise-class data warehousing applications. These tools are often based on a three-tier architecture in which data is only presented on the desktop, while query processing is done on an application server and the database is stored on a separate machine.

"These tools are pliant enough that administrators may avoid stupidly passing too much data over the network," said Bob Moran, an analyst at Aberdeen Group, Inc., a market research firm in Boston.

The as-yet-unnamed Sagent offering will have native connections to popular databases, so users will be able to perform high-end analysis on relational data without moving it into a separate database, according to Perry Mizota, vice president of marketing at Sagent.

Initially, databases from Informix Software, Inc., Oracle Corp. and Sybase, Inc. will be supported.

Users will also be able to access numerous other data stores through the Open Database Connectivity protocol. The software will run on Windows clients and Windows NT servers, Mizota said.

Sagent's tool will compete with Information Advantage, Inc.'s DecisionSuite and Prodea Software Corp.'s Prodea Beacon, both of which support three-tier warehousing applications.

Because Sagent's offering is designed to keep users from having to write their own queries and reports, it will also face off against tools such as Business Objects, Inc.'s Business Objects and Cognos, Inc.'s Impromptu. Mizota said the Sagent offering will support SQL, but it would extend the limitations of the standard database language with functions, such as rankings, that are not currently supported in SQL. ■

Start-up gets a running start

Summer
Ken Gardner and John Zicker, cofounders of ReportSmith, form Sagent with about $1 million of venture capital.

Winter
Sagent is scheduled to announce its data warehousing decision-support products.

1995 | 1996

Fall
The company, now with 12 employees, secures an additional $5 million of venture funds. Stewart Schuster, former marketing chief at Sybase, joins Sagent's board of directors.

Summer
Company plans to deliver first set of products.

New publishing containers face great technical divide

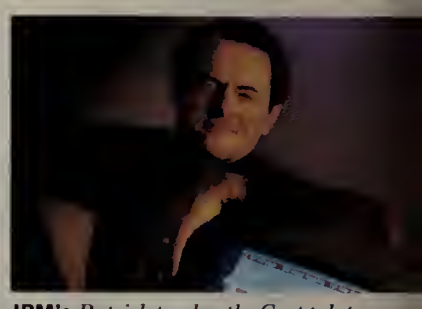
EPR opens up DigiBox while IBM stuffs Cryptolopes.

By Ellen Messmer

Giant IBM and tiny Electronic Publishing Resources, Inc. (EPR) last week each unveiled at Internet World encryption containers for selling copyrighted information over the Internet, both hoping to fuel a new era in electronic commerce.

Each technology allows vendors to sell copyrighted information to one buyer, who can pass it along in encrypted form to a friend or colleague who may also choose to buy it (*NW*, Oct. 16, page 1).

EPR's DigiBox secure container, however, is quite different from IBM's product, called Cryptolope. This raises the question of whether the Internet will soon be littered with different cryptographic envelopes, requiring multiple clients.



IBM's *Patrick pushes the Cryptolope.*

This interoperability issue last week prompted the Information Industry Association to form an Electronic Rights Management Group to push for voluntary open standards.

IBM early next year will set up a utility on its InfoMarket on-line World-Wide Web service for stuffing Cryptolopes with copyrighted information. These content-packed Cryptolopes can only be decrypted after a registered InfoMarket user has agreed to pay the charges associated with obtaining it, said John Patrick, IBM's vice president of Internet applications.

Analyst Robert Weber, principal at Boston-based Northeast Consulting Resources, Inc., said IBM's Cryptolope and EPR's DigiBox, both secure containers, function differently.

"IBM is using a wide-area search engine to locate content on its service, and the Cryptolope is designed to phone home to the IBM clearinghouse for payment processing once the InfoMarket subscriber agrees to the terms," said Weber.

EPR's DigiBox, a secure container with administrative controls, has more flexible options for arranging payment, irrespective of transport.

Novell, Inc.'s Internet Commerce Division last week voiced support for EPR technology. ■

Sneak peek

Notes 4.0 dashes to the finish line with new Navigator features in tow

By Doug Barney

If building Notes Release 4.0 has been like running the Boston Marathon, Lotus Development Corp. just reached Heartbreak Hill, some 20 miles into the race.

The company has shipped Test Build 2 (TB2) and started up what it hopes will be the last major climb before the production issue of the product is released later this year.

Proud of their progress, Lotus officials stopped by *Network World* last week to demo the product and dropped off a copy of the latest beta release. (Look for a review in an upcoming issue.)

TB2 includes a number of features never before seen, the most dramatic of which is the InterNotes Navigator.

Notes' client access to the World-Wide Web has several requirements: the InterNotes Navigator browser on the client; settings to convert URL to Notes doclinks; and reconfiguring the name and address book to include the InterNotes server, a Notes Companion product that ties the groupware product to the Web.

The overall system also requires a WEB.EXE file on the server that allows it to talk to the 'Net and convert HyperText Markup Language documents into Notes format.

The browser should feel familiar to anyone used to Netscape Communications Corp.'s Web tools or other popular browsing products. When users view a Web page, the context-sensitive Notes action items automatically change to options such as Home, Open, History, Reload, Recommend, Forward and Bookmark.

While its features are impressive, the browser is little more than a Notes database with a bitmap interface tailored to access the Web. In fact, these Web pages are actually Notes documents and can be treated as such. For instance, an end user could replicate interesting pages to other servers, or send copies via electronic mail to individuals. Despite the conversion of Web pages to Notes, the full fidelity of their graphics is maintained.

Plenty of cache

Because Web pages are converted to Notes, the most popular ones can be cached on the Notes server for faster access.

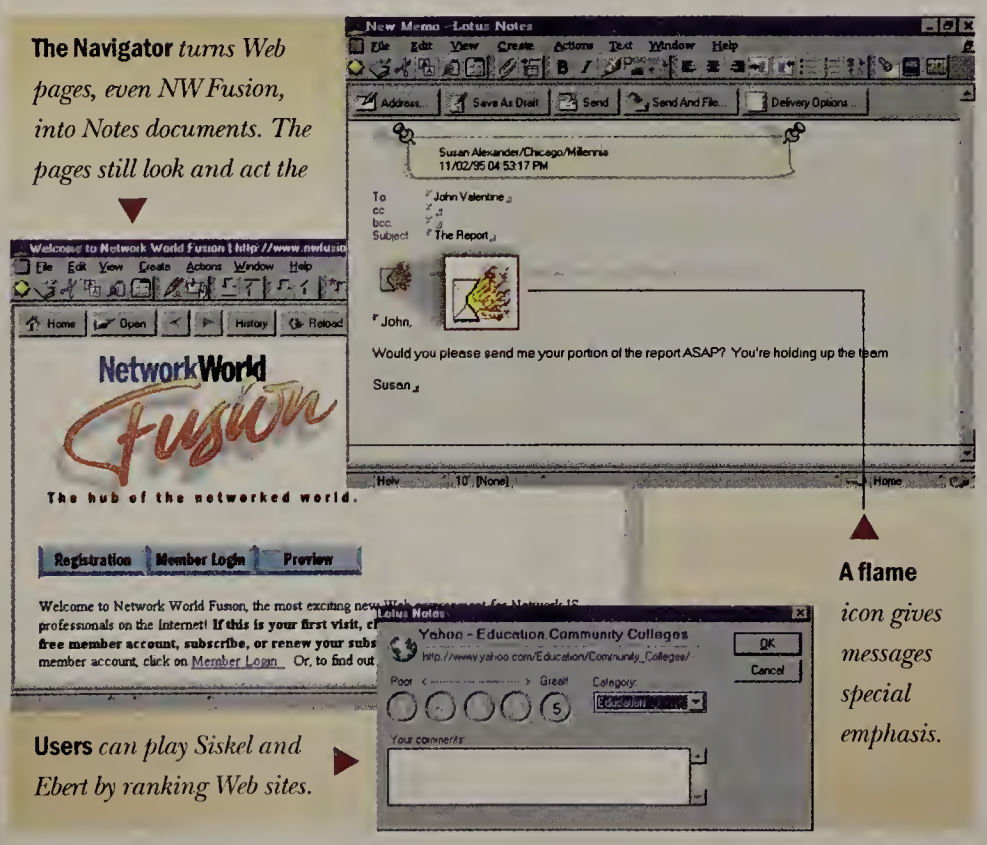
Lotus claims a number of benefits for its system. For one, users access the 'Net over a LAN, eliminating the need to have TCP/IP on each desktop. This approach also provides for better security since there are fewer access points to the Internet.

More things change

Current users will notice a slightly different feel in the Notes work space, the central interface for the product. Lotus has gussied up the work space with a textured surface, replacing today's flat look. Perhaps more important, Lotus will allow more than six database icons to fit on the work space, and related ones can be stacked.

Lotus has added a few fancy touches to its long-maligned E-mail client. In addition to the

See **Lotus,** *page 12*



The Navigator *turns Web pages, even NW Fusion, into Notes documents. The pages still look and act the*

A flame *icon gives messages special emphasis.*

Users *can play Siskel and Ebert by ranking Web sites.*

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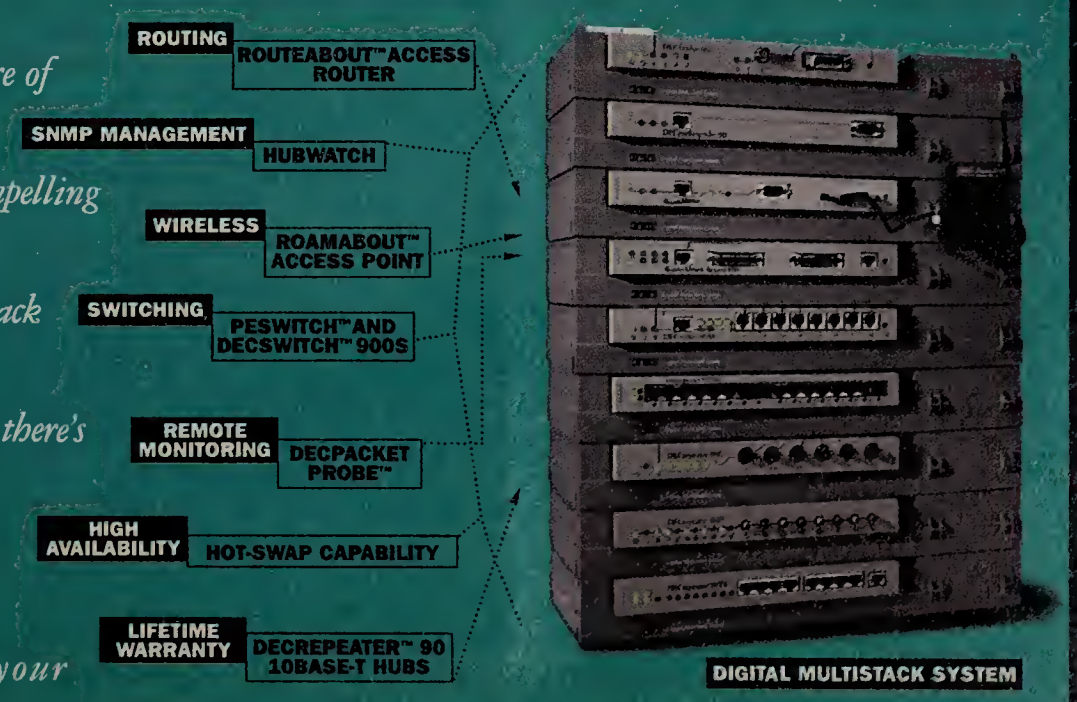

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Microsoft embraces the mainframe

By John Cox
Redmond, Wash.

The company that brought us Flight Simulator and Windows General Protection Faults is getting into the business of selling mainframe software.

Microsoft Corp. has acquired Netwise, Inc., a tiny Boulder, Colo., middleware vendor that specializes in products that connect DOS and Unix applications with mainframe CICS and IMS TM applications. The immediate benefit for Microsoft customers is the ability to forge two-way links between NT-based BackOffice applications, such as SQL Server and SNA Server, and mainframe transaction applications.

Microsoft's Voth *foresees tools generating OLE objects instead of SQL Server stored procedures.*

"This is a significant move," said Robert Marsh, a consultant in Atlanta who specializes in integrating BackOffice with SNA and Application System/400 networks. "They have been producing excellent products [such as SNA Server] around the edges of large enterprise networks. Now with the TransAccess family, Microsoft is right there in the mainframe itself... ."

Microsoft's practice of leaving interoperability with mainframe applications up to third-party partners has met with strong resistance from enterprise customers, according to Bobby Cameron, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

"Buying Netwise means [Microsoft is] under pressure ," he said. "Customers want to access data and run transactions on legacy systems without changing those systems. And they want to go through CICS and IMS to maintain things like security and referential integrity."

In the long term, Microsoft officials said they plan to tightly integrate the Netwise TransAccess products with SQL Server, Microsoft's visual application development tools and OLE technology (see graphic).

"A reasonable person could expect us to do is extend the TransAccess tools so they can create OLE objects to 'wrapper' mainframe transactions," said Gary Voth, Microsoft's SQL Server group product manager.

"In future, these tools could generate OLE objects instead of just SQL Server stored procedures," he said. "The cool thing is it's not necessary to provide OLE fully on the mainframe to do this — mainframe applications don't have to change."

Not quite there yet

But nirvana is a long way off, analysts cautioned. "The goal is to call mainframe applications as if they were just another OLE object," said Betsy Burton, research director of strategic data management at Gartner Group, Inc. in Stamford, Conn. "But there's a lot of work that needs to be done before that can happen. This won't become a reality in terms of Network OLE, [which will let OLE objects interact over a network], until 1998."

The Netwise products support a two-way connection, so the mainframe applications can act both as servers and clients to NT-based applications. A key feature of these products is they connect to the CICS or IMS transaction systems, which control mainframe COBOL applications. These applications, in turn, access the mainframe databases.

"In the mainframe, the application code is a major part of the security picture," said John Mann, director of client/server computing at The Yankee Group, a Boston-based technology research company. By using a transaction interface to data, TransAccess also lets application developers change back-end databases and servers without affecting end users.

"Transactions are a much cleaner way to access mainframe data [than direct SQL access]," Mann said.

Today, the TransAccess Application/Integrator can generate compiled Dynamic Link Libraries that can be called by Microsoft Visual Basic applications to execute mainframe processing. The Application/Integrator Workbench lets Microsoft SQL Server activate mainframe stored procedures. Conversely, mainframe programs can access data on the Microsoft database. And the Netwise products currently can use SNA Server as a gateway to mainframes.

Microsoft has acquired all the technology assets of Netwise and will retain nearly all of its 49 employees, including about 25 engineering, sales, marketing and support staff. The staff and products will constitute, under Microsoft's Developer Division, a new product unit at the company's Redmond headquarters. Voth said Microsoft will support the existing installed base.

The acquisition, completed just over a week ago, was structured as an asset acquisition. Voth would not disclose Netwise's sales. Gartner Group's Burton estimated them to be about $7 million in the most recent fiscal year.

✆Microsoft: (800) 426-9400.

Microsoft gets wise on middleware

Here's what the acquisition of Netwise brings to the table:

- **TransAccess Application/Integrator:** Tools for linking LAN-based Windows and Unix applications – via CICS or IMS TM – to COBOL-based mainframe programs.
- **TransAccess Application/Integrator Workbench:** Software that lets the Microsoft SQL Server database execute mainframe-based stored procedures and gives mainframe transaction programs access to SQL Server data.
- **TransAccess DB2/Integrator:** PC and mainframe code that automatically translates Open Database Connectivity (ODBC) calls from desktop query tools into DB2 SQL calls.
- **TransAccess Legacy/Integrator:** Software that links ODBC calls to assorted mainframe databases, such as Adabas, CA-IDMS and VSAM.

StrataCom adds FRAD to the switch mix

By Tim Greene
San Jose, Calif.

By the end of next year, StrataCom, Inc. will upgrade the software for its IGX, IPX and BPX switches to enable users to support LAN, voice and legacy traffic without using separate frame relay access devices (FRAD).

The company has already taken the first step in that direction by shipping switch software that enables frame relay port cards to terminate frame relay links supporting LAN traffic.

Enhancements that will make it possible to support voice and legacy traffic are scheduled for next year, according to Byron Henderson, StrataCom's director of access products.

In a traditional StrataCom configuration, LAN traffic bound for a router at a switching site would have to pass through a FRAD to the switch, then pass through a second FRAD out to the router (see graphic).

With the new capability, that same traffic is converted from cells back to frames in the switch and fed to a router connected directly to a frame relay port.

With frame relay interworking, the switch can port LAN traffic directly to a router at the central site. So the second FRAD becomes unnecessary, making for a more streamlined network architecture, Henderson said.

"You don't need access devices at each end," said Jennifer Pigg, an analyst with The Yankee Group in Boston.

Philip Whitehouse, communications engineer for Central Maine Power Co., whose network includes 14 IPXs, said his company is installing the newly enabled FRAD cards next month.

"It will allow us to port the remote [FRAD] directly into the IPX for data. You still have to have another [FRAD] to do voice," Whitehouse said.

StrataCom said that with the upgrades it plans for next year, both voice and legacy data traffic, such as SNA and X.25, will also be terminated on the switch without any need for the second FRADs.

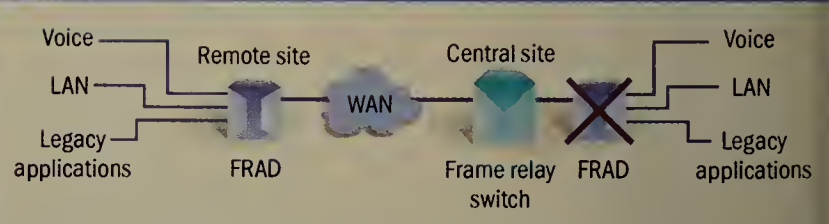
Central Maine is also revising its network architecture by installing separate hardware — StrataCom FastPad FRADs — at remote sites to consolidate voice and data traffic over frame relay lines to switching sites, allowing the company to get rid of separate data and voice lines. "I'm about 600 bucks per month to the good by doing this," Whitehouse said.

Because StrataCom sells its own FastPad FRADs, it can offer StrataView Plus, a single management platform for both FRADs and switches.

StrataView Plus allows what StrataCom calls autorouting, which defines the endpoints for traffic and lets the network define the actual connection depending on traffic load at the time.

Since both the FRADs and switches operate under the same software, StrataCom can also offer FrameClass traffic prioritization to sort traffic and rank it for priority: voice, delay-sensitive traffic such as SNA, and non-delay-sensitive traffic. ■

Hold that FRAD



StrataCom is adding interworking software to its frame relay switches, allowing them to terminate voice, LAN and legacy traffic. Currently, a FRAD is needed alongside the switch to perform that task.

GRAPHIC BY TERRI MITCHELL

Lotus

Continued from page 10

three-pane view — folders, InBox, Preview — the system lets you choose from a variety of letterheads.

A message can look like it was tacked to a bulletin board, taped to a wall or just came from the post office.

Messages can also have mood stamps, including flames, a happy face, or messages such as "confidential," "official" and "joke."

While Lotus pushes Notes databases as the preferred method for discussion, it will offer an easier way, too. With Release 4.0, users will be able to set up and manage threaded discussions employing only E-mail.

Because so many documents are created by a group, Lotus has built the Document Library Template. This creates a review cycle for documents prior to public posting.

TB2 is in the hands of some 10,000 testers, and with all of them pounding on it, Lotus hopes to give Notes customers a bug-free Christmas present. ■

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Processing the impact of the Pentium Pro

By Ben Heskett
Santa Clara, Calif.
Intel Corp.'s introduction of a high-octane processor last week has sent ripples throughout the network industry. The processor will serve as an engine for higher performance servers that can handle more sophisticated applications.

The unveiling of the Pentium Pro (p6), the delivery of powerful new database and operating system software, and the emergence of clustering technology, make it clear that the tools of the server game are changing.

"A quad-processor Pentium Pro is basically a mainframe," said Lew Paceley, Intel's marketing director for the p6.

The Pentium Pro — available in single- and multiple-processor configurations — is expected to be the foundation for a variety of servers that may be powerful enough to challenge minicomputers, Reduced Instruction Set Computing (RISC)-based machines and other high-end systems (see story, this page). Pentium Pro-based machines may also help companies unlock the power of advanced software.

"We've been trying to stuff 20 pounds of software into a 5-pound bag. The p6 will let the virtues of Solaris shine through," said Steve MacKay, vice president and general manager of Solaris products at SunSoft, Inc.

Wonder where all those defective Pentium chips went? Intel is embedding them in gold-plated, snowflake-shaped, genuine Intel Inside Christmas ornaments. For only $7.95, you can buy them on-line at http://www.intel.com/intel/intelis/shop/ornament.html.

The power of the new processor may also make it possible for companies to consolidate servers to simplify LAN management.

"Because of the greater performance, you might be able to do some consolidation. So even with processor-heavy applications, you're not going to have to have to run multiple servers," said Michael Simpson, a product-line manager at Novell, Inc.

Intel inside

The least powerful Pentium Pro offers 16 times the power of Intel's previous processor incarnation, the Pentium, and other models are even faster. And the existence of Level 2 cache within the chip, rather than external to it, makes the Pentium Pro ideal for running the new wave of 32-bit applications on the market.

Analysts say p6-based servers may not become pervasive until late 1996 or early 1997. With the advent of the Pentium Pro, however, a drop in the price of Pentium processors — and subsequently, Pentium servers — is expected.

Once Pentium Pro servers are available, software vendors expect the machines to be a performance boon.

"With the Pentium Pro, customers can build low-cost, fault-resilient applications that scale throughout the organization. And they can do this using PC servers," said Richard French, vice president of the Intel Unix products division at Oracle Corp.

Oracle next week will demo a version of its Oracle7 Parallel Server database running on a four-node cluster of Compaq Computer Corp. ProLiant Pentium Pro quad-processor servers. French said the demo will show near-linear scalability among the four nodes.

Oracle's database for the Pentium Pro, which will initially run on UnixWare, is expected to ship in mid-1996, French said.

Users will be able to achieve the performance from their databases on the p6 that before was only available from higher end proprietary architectures.

"[The p6] completely undermines the whole value proposition of RISC," which is generally used in more technical environments, said Peter Lowber, a Lexington, Mass.-based analyst with the DataPro Information Services consultancy headquartered in Delran, N.J.

Oracle rival Sybase, Inc. also plans a version of its database, SQL Server, for the Pentium Pro but declined to say when it would be available. As for the database's performance, Sybase officials said it's too soon to tell how it would run on the new chip.

"SQL Server is closely optimized to the processor, and we'll be working with Intel to exploit every ounce of the power in the Pentium Pro," said Bruce Armstrong, vice president of database server products at Sybase.

On the operating system side, vendors licked their chops at the possibilities.

The next generation of Windows NT, code-named Cairo, will rely on clustering and multiprocessing, Microsoft officials said, two things users will come to associate with the Pentium Pro.

Senior Editors Barb Cole, Kevin Fogarty and Peggy Watt contributed to this story.

AT&T, Time Warner eye joint attack on local service mart

By David Rohde
Bedminster, N.J.
AT&T officials last week confirmed they have held discussions with the Time Warner Cable division of Time Warner, Inc. about a joint attack on the local telephone market.

The discussions come amid published reports that AT&T is also discussing deals with Continental Cablevision, Inc. and Cablevision Systems Corp. Helping fuel this activity is AT&T Chairman Robert Allen's recent disclosure that the carrier is considering facilities-based entry into the local market (*NW*, Oct. 30, page 1).

A hookup with a troika of cable companies would echo Sprint Corp.'s strategy of partnering with three cable firms. In another similarity, both AT&T and Sprint have spent huge sums obtaining broadband wireless licenses from the federal government. These licenses could further help the firms break into the local loop.

"We're in discussions with a number of companies regarding local services and access," said spokesman Dave Johnson at AT&T's Network Operations Center here. "Time Warner is one of these companies."

Industry sources believe AT&T will probably not have to structure any cable deal as tightly as the Sprint Telecommunications Venture, which is a formal joint venture with separate management.

"AT&T is going to pursue a wide range of local options because it wants to get into the local loop as quickly as it can," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Verona, N.J. "And for the cable companies, the AT&T brand is very, very attractive."

The talks between AT&T and Time Warner are "exploratory in nature," cautioned a cable industry source.

A Sprint spokesman pointed to potential legal hurdles if AT&T attempts to emulate Sprint's moves. While Time Warner's partnership with US WEST, Inc. has recently turned acrimonious, he said, regulators might question AT&T and an RBOC — which are still barred from certain business deals together under the original AT&T breakup — from dealing with the same partner.

Planning a break-in

AT&T is also planning to turn to wireless local-loop technologies to quickly and inexpensively break into the access market.

"Because of the strength of the local monopolies, [new local players] need a strategy to spend as little capital as possible" in order to compete, said Richard Bodman, AT&T senior vice president for corporate strategy and development, in an interview with *Network World* last week.

The AT&T local strategy will include wireless, services resale and facilities construction; the company intends to soon begin a state-by-state evaluation of local markets, Bodman said. Which tack to take in each market will "fold out differently in every state" depending on the competitive climate there, he said.

Senior Editor Joanie Wexler contributed to this article.

Servers fuel up with Pentium Pro

An avalanche of new server products accompanied the launch of Intel Corp.'s powerful Pentium Pro chip this week.

Vendors said they are trying to leverage the benefits of improved performance and speed of the Pentium Pro, but they acknowledged the possibility that a network may need a complete overhaul because of the new power.

"We're trying to find a balance point between completely revamping the technology set so that the customers don't feel like it's a lot of new stuff that they've got to completely reevaluate, retest and recertify, and yet bring the new technology to the table," said Chris Norman, AST Computer, Inc.'s director of marketing for server products.

Some are finding the move to Pentium Pro to be complicated. Compaq Computer Corp. has delayed the launch of its Pentium Pro-equipped PCs from later this year until the first quarter of 1996 due to problems when the new processor was tested with a variety of network cards.

Most vendors are shooting for the first quarter of 1996 for shipping the new servers.

Announcements include:

- Unisys Corp. will introduce five new products in the first quarter of 1996.

The SFR Pentium Pro rackmount superserver model, SFE fault-resilient model, SME quad-processor model, SVD Pentium Pro entry-level dual-processor model, and CMT expandable mini-tower feature RAID compliance, environmental monitoring and management software that supports a variety of operating systems. Prices range from $2,600 to $19,000.

- AST Computer joined the fray with the announcement of its Manhattan servers, also available in the first quarter of 1996. Quad-processor Manhattan models are expected to ship in the second quarter.
- Tricord Systems, Inc. is developing a new line of its PowerFrame enterprise servers based on the Pentium Pro processor. The servers are due out in 1996.
- In a related announcement, Sequent Computer Systems, Inc. developed a high-powered linking technology that will let users hook up more than 250 processors at once. Sequent in late 1996 will unveil its NUMA-Q architecture, which is targeted toward the high end of the market and features the high-speed interlink.

Others that will join the Pentium Pro-powered server fray include: Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., IBM and NetFRAME Systems, Inc.

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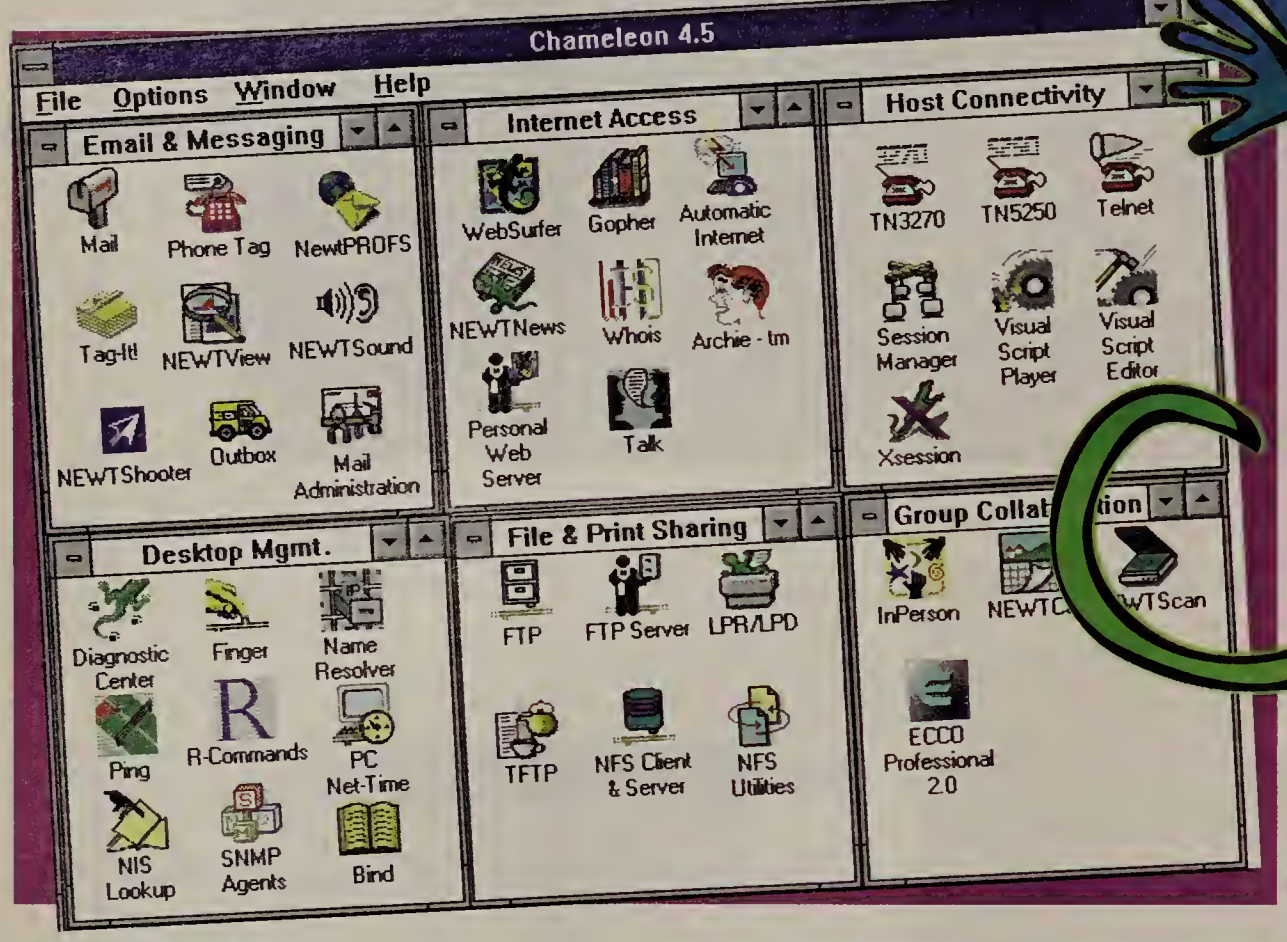

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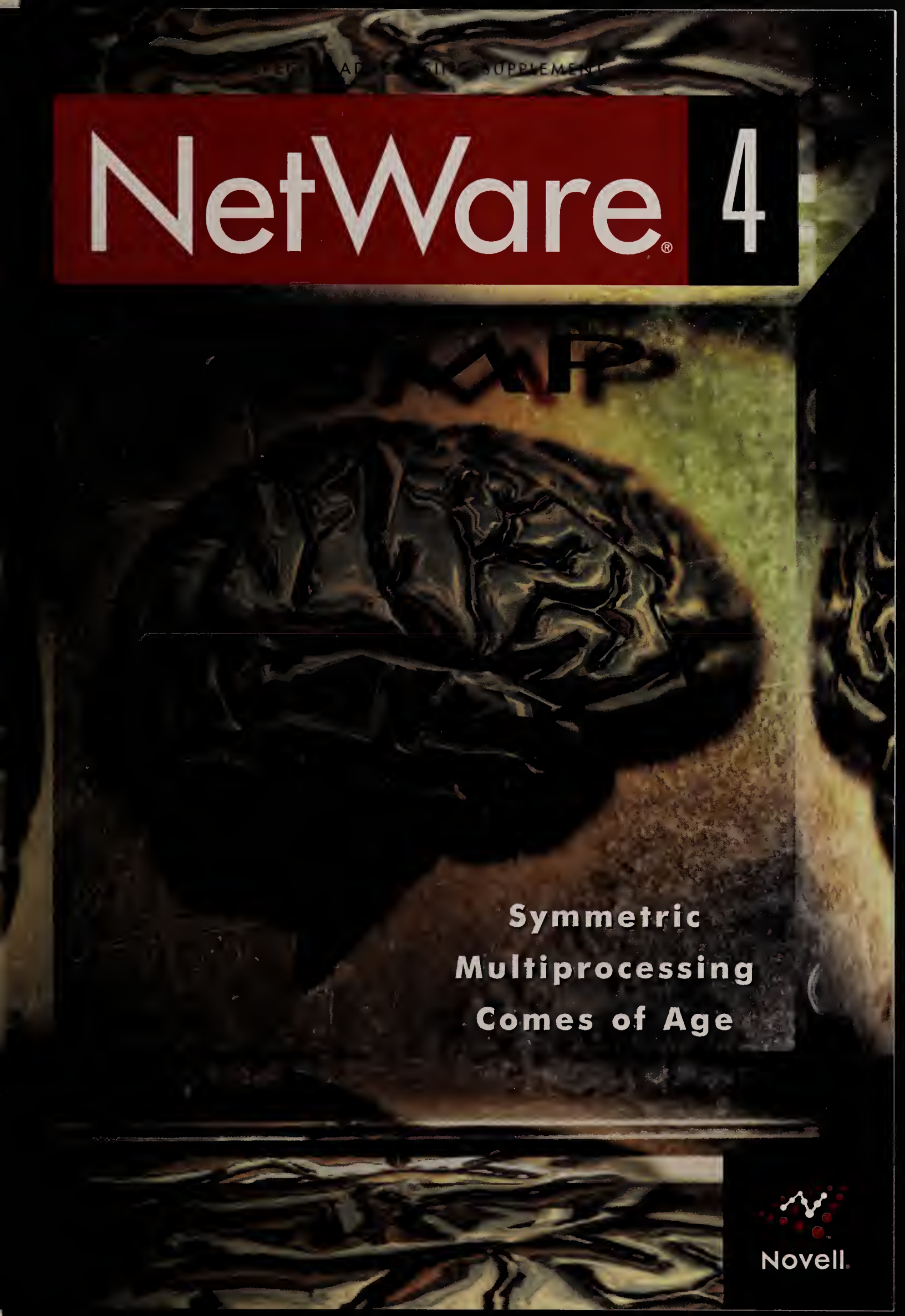
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The OEM Approach

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Network Multiprocessing Comes of Age

As information systems managers or network administrators, you're trying to keep pace with your users' growing need for information where, when and how they need it. Many of you are stretching the capabilities of your information infrastructure by implementing resource-intense database, document management and multimedia applications to give your users access to information in more user-friendly formats, such as voice and video. In addition, as your company grows you are probably adding more and more users to existing servers. Adding these services places more

Multiprocessing Meets the Growing Need for Information

demands on your network servers. Servers that previously supported only file and print services with a manageable number of users, now offer a wide variety of services and productivity applications.

Typically, the solution is to add more servers to the network. But with today's tight budgets, that's often difficult. What's needed is a solution that gives you the necessary processing power to meet your users' growing demands today and tomorrow. Fortunately, that solution is now available. It's called symmetric multiprocessing (SMP).

Hardware solutions have often outpaced the availability of software solutions.

Symmetric Multiprocessing —A Brief History

Since the early days of the PC industry, hardware vendors have worked at a dizzying pace to provide you with more powerful, less expensive computer hardware. This trend has helped many of you implement your company's enterprise-wide networks and has also played a key role in ushering in the information age.

There has, however, been a drawback to this rapid pace of hardware development. Hardware solutions have often outpaced the availability of software solutions that enable you to take advantage of the faster hardware. This has also been the situation in the multiprocessing market. Hardware vendors have been offering leading-edge multiprocessing computers for some time, which have met limited success until recently. This has been due in a large part to the lack of software—including operating systems and applications—that exploit the multiprocessing architecture.

Cooperation Breeds Solutions to Meet Customer Demand

Today things have changed—hardware, application and operating system vendors are all working together to provide you with comprehensive multiprocessing solutions. The industry is moving toward a common multiprocessing standard. In addition, several vendors are continuing to offer their own multiprocessing architectures, giving you a variety of options. And application and operating system vendors are developing software products that use these hardware features to provide you with solutions that leverage the processing power and scalability of multiprocessing computers.

This cooperation and the resulting proliferation of multiprocessing solutions is great news for those of you seeing increased demands being placed on your information infrastructure or simply wanting the comfort that your network can grow as your business grows. By incorporating these new multiprocessing hardware and software solutions into your network computing environment, you can benefit from the improved scalability and performance of multiprocessing.

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Novell Leads the Symmetric Multiprocessing Charge

With a 66 percent share of the network operating system market, Novell® plays a critical role in how symmetric multiprocessing affects millions of NetWare® users worldwide. Novell prides itself on listening to its customers. And over the last two years, the company has heard from an increasing number of you about the need for multiprocessing support in NetWare to meet growing scalability and performance requirements.

To meet your multiprocessing needs, Novell now offers NetWare 4.1 SMP.

To meet your needs, Novell now offers NetWare 4.1 SMP™ This add-on service to NetWare 4.1 is designed to give you increased scalability and performance, improved server bandwidth and compatibility with existing applications—all available on industry-standard hardware. To accomplish these design requirements, Novell relied on its technical expertise and that of its partners. Novell also worked closely with its original equipment manufacturer (OEM) partners to offer NetWare 4.1 SMP in a way that optimizes product integration, service and support.

Understanding SMP

Symmetric multiprocessing is a form of multiprocessing that is becoming common among today's hardware, application and operating system vendors to provide you with effective multiprocessing solutions.

Key to the SMP multiprocessor architecture is the way it manages shared resources. In a single-processor system, tables and files in memory do not need protection against simultaneous writes by the central processing unit (CPU) since each thread is processed in sequence. In a multiprocessor environment, however, tables must be shared by various processes simultaneously at the server, so the shared data must be protected. The SMP architecture accomplishes this through the use of "locks." Locks manage memory operations so that only one processor or device can change the target location memory during the same hardware cycle.

NetWare 4.1 SMP incorporates the use of a pre-emptive kernel to provide a completely symmetric environment for SMP-aware applications, while providing backward compatibility for existing applications.

A New Era in Symmetric Multiprocessing

The industry is at an exciting point in the history of computing. Several market trends have come together at the right time to provide the solutions you need for the increased demands being placed on your information infrastructure. The proliferation of high-performance multiprocessing hardware, Novell's new add-on multiprocessing service to its NetWare 4.1 operating system and the availability of multiprocessing applications now allow you to effectively incorporate multiprocessing capabilities into your networks, addressing your company's information needs today and tomorrow. ■

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NetWare 4.1 SMP—A Look Under the Hood

Novell's New Product Delivers Increased Performance

When buying a high performance sports car, most people look under the hood to get a real sense of the car's capabilities. The same is true when evaluating multiprocessing products. With the promise of increased performance and scalability, it's important to have a thorough understanding of a product's capabilities. This article looks at Novell's multiprocessing solution—NetWare 4.1 SMP. It also explores the advantages of Novell's multiprocessing design approach.

What is NetWare 4.1 SMP?

NetWare 4.1 SMP is Novell's latest solution

to address your requirements for increased processing power and scalability in the NetWare environment. The product is an add-on service to native NetWare 4.1 that gives NetWare the ability to support up to 32 processors in one SMP server.

The product consists of an SMP NetWare Loadable Module™ (NLM™) and associated files that need to be added to the server. If you are purchasing a new multiprocessing system from one of Novell's OEM partners, NetWare 4.1 SMP may already be installed.

NetWare 4.1 SMP is Novell's latest solution for increased processing power and scalability.

Under the Hood

Under the hood of NetWare 4.1 SMP, Novell uses a design approach that incorporates an SMP kernel to the operating system. This approach offers excellent scalability, dramatic improvements in performance and backwards compatibility with existing NetWare 4.1 NLMs. This approach also provides automatic load balancing for the best possible scalability and performance gains.

Novell has added SMP support to many of the NetWare 4.1 core components and modules, including CLIB, ODI, NLSP and RSA encryption. By enabling these functions to run simultaneously on several processors, client requests and server activity can run in parallel. And since these processes are offloaded from the main processor (processor 0), more overall system capacity is available to handle non-SMP-aware activities. This increased bandwidth enables you to do more on a single server, potentially delaying the purchase of additional servers and increasing the capabilities of your computing environment.

Increased Performance

When NetWare 4.1 SMP and SMP-aware applications are added to NetWare 4.1, additional performance is achieved. By comparison, a server with one processor can only complete a finite set of work. Each process you add to the server, decreases the processing power available for other processes. NetWare modules, services and applications—using a single processor—generate many threads that must be executed serially or one thread at a time. Because these services and applications have become more resource-intense, a single processor can become overloaded executing processes one thread at a time.

However, when additional processors are added to the system, processes can be executed on several processors at the same time. Since applications are executed on several processors simultaneously, the system can accomplish more work in a shorter amount of time, increasing performance and operating much more efficiently.

Novell's preliminary benchmarks indicate that NetWare 4.1 SMP increases performance for file and print operations, and significantly enhances SMP-aware application performance. These benchmarks, currently being performed, will be available soon.

Improved Scalability

As your business grows and more demands are placed on your computing environment, it would be ideal if your network operating system could grow as well. Until now, the answer was to add single-processor servers to your network. NetWare 4.1 SMP solves this problem by allowing you to incrementally add processors to your servers as more performance is needed. This gives you the

To benefit from NetWare 4.1 SMP, you need the right equipment. To learn more, you need a pen.

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- ☐ AT&T GIS
- ☐ Compaq
- ☐ Dell Computer Corp.
- ☐ Digital Equipment Corp.
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- ☐ Hewlett Packard
- ☐ IBM
- ☐ NetFRAME
- ☐ Olivetti
- ☐ Tricord Systems
- ☐ Unisys Corporation
- ☐ Zenith Data Systems

How many workstations are at this location?

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- ○ 25-49
- ○ 50-99
- ○ 100-499
- ○ Over 500

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- ○ Evaluate and recommend
- ○ Decision made elsewhere

What is your purchase time frame?

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- ○ 2-3 months
- ○ 4-6 months
- ○ Longer

Are you a reseller? ○ Yes ○ No

Do you have a preferred reseller? ○ Yes ○ No

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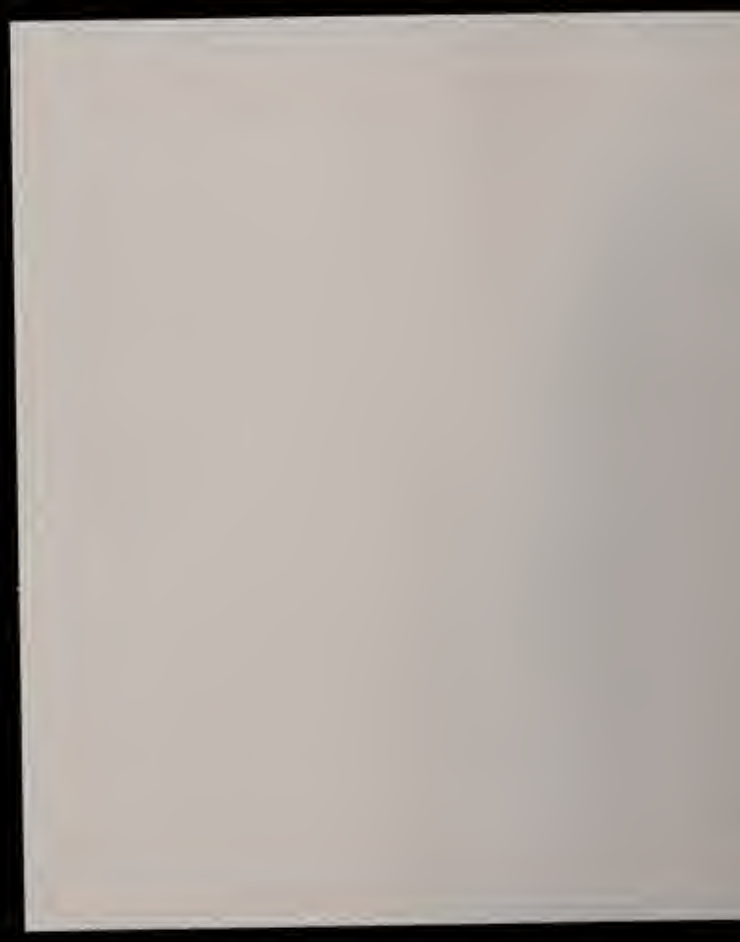

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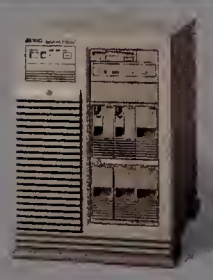

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scalability you need for growth, without having to buy additional single-processor servers. In addition, because NetWare 4.1 SMP is an add-on service, it easily integrates into your new or existing NetWare 4.1 computing environment.

Backwards Compatibility

NetWare 4.1 SMP was designed so that you can continue to use your existing NetWare 4.1 NLMs and applications. Although existing applications won't experience the dramatic performance gains of SMP-aware applications, they will run on an SMP server. This is an important feature if you are a current NetWare user and plan to implement SMP into your existing environment.

While maintaining support for legacy NetWare 4.1 NLM applications, NetWare 4.1 SMP also provides an application programming interface (API) set for developers to write SMP-aware applications. The API set enables multithreaded applications to leverage NetWare 4.1 SMP, providing optimal performance benefits and scalability.

NetWare 4.1 SMP Delivers

Just like today's high-performance sports cars, Novell's NetWare 4.1 SMP delivers on the promises of multiprocessing. The unique combination of performance, scalability, backwards compatibility and increased server bandwidth makes NetWare 4.1 SMP a good solution for meeting the growing demands that are being placed on your network computing environment. ■

NetWare is Becoming a Popular Development Platform for Growing Internet Server Market

American Internet is one of several companies developing Internet servers based on NetWare 4.1 SMP. According to Throop Wilder, president and CEO of American Internet, "NetWare is an ideal platform for our Internet products. It will give our customers the performance, scalability and ease of use they will require as Internet use continues to explode."

More Robust Solutions Needed

Today, many Internet servers are based on public domain code that doesn't meet the reliability, scalability and performance requirements of today's high-volume Internet use. In addition, single-processor servers—while powerful enough for many of today's demands—will not be enough to meet tomorrow's expected growth.

NetWare 4.1 SMP for High Performance and Scalability

Internet customers need a solution with the high performance and scalability that can meet expected growth and increased demands for information. American Internet found that NetWare 4.1 SMP is an ideal development platform. "Our products are written to take advantage of multiprocessing servers to allow our customers to scale their Internet servers as demand for information grows," stated Wilder. "In addition, most Internet transactions are file-based and NetWare is very efficient when handling files. This gives customers a boost in performance."

Internet Solutions

American Internet plans to ship two products based on NetWare 4.1 SMP. The first is a World Wide Web server NLM planned for release in November. The second is an integrated Web server suite of products, code named Destiny, that will provide mail, Web, domain name and FTP services. Destiny is scheduled to be available the first quarter of next year.

"We've heard that it's hard to develop NetWare applications," added Wilder. "We have not found that to be true. We have a great development staff that is going gangbusters developing these products on the NetWare platform."

Wilder expects the World Wide Web server to see success in Fortune 2000 companies as an internal Web server, giving employees easy access to company information. And he expects the Destiny product to become popular among the growing number of Internet providers.

"Our job is to provide solid, high-performance, scalable and easy-to-use Internet servers to our customers," added Wilder. "NetWare 4.1 SMP is helping to make that happen."

"Say over the next few years my business doubles.
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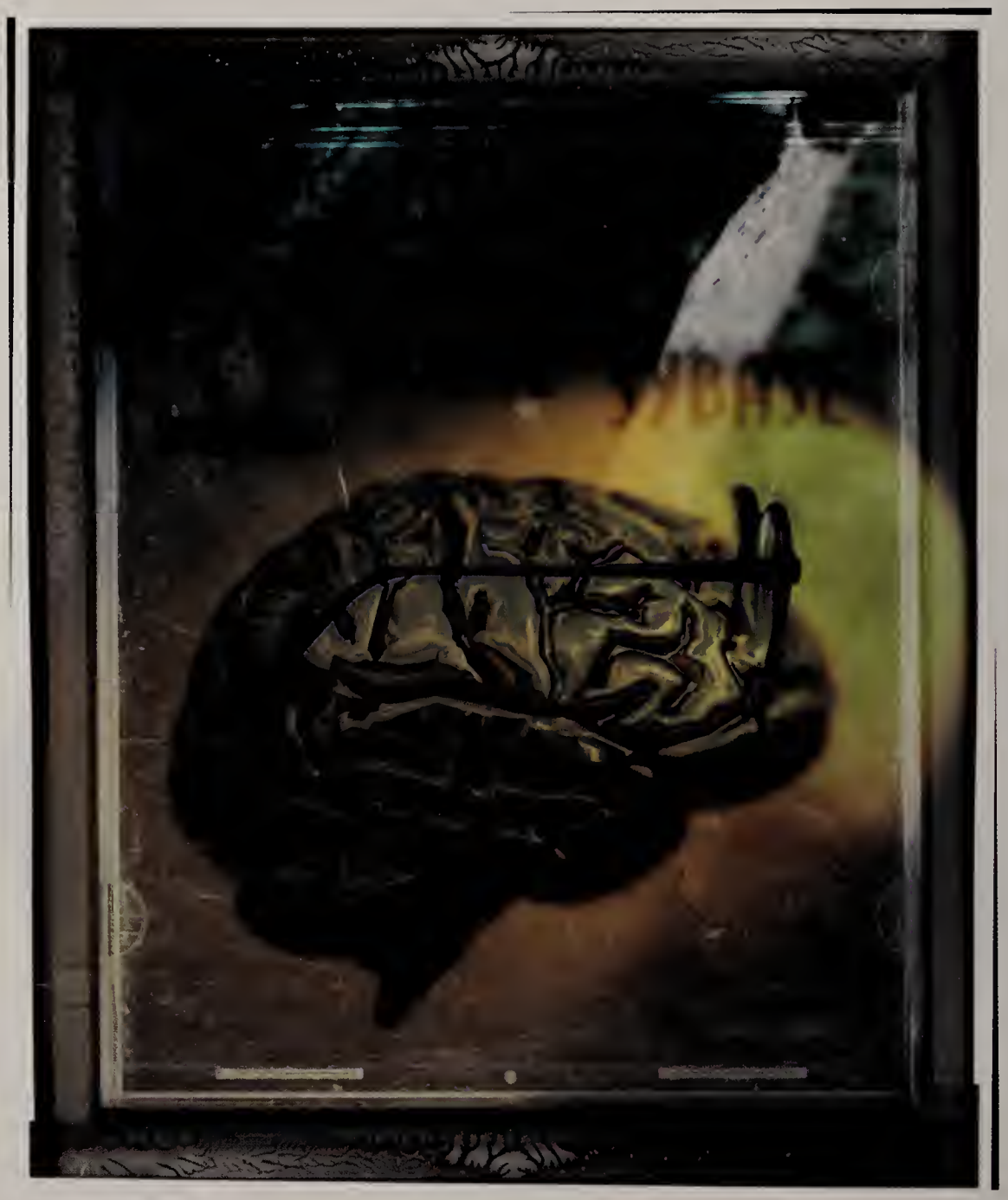
[1]Second Pentium chip sold separately. [2]Some hardware/software configurations may be necessary [3]In Canada, call IBM's HelpFax at 1 800 465-3299 (ask for document #45200). IBM and SystemView are registered trademarks and NetFinity and "There is a difference" are trademarks of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. ©1995 IBM Corporation.



Is NetWare 4.1 SMP Right for Your Company?

To help you decide if NetWare 4.1 SMP is right for your computing environment, evaluate the types of network applications that you are using now or plan to implement over the next three to five years. If you're like most companies, your users are creating and demanding access to greater amounts of information every day. And they want it in more user-friendly formats.

Evaluating Your Applicotions Con Help You Decide

Greater demand for data means that you'll most likely implement or expand your use of databases, groupware, routing, management and Internet access applications. All of these applications are resource-intense, meaning

they place greater processing demands on your network operating system and servers.

Applications that Benefit from SMP

If your organization is running large database applications, number-crunching applications, a large number of groupware clients or other resource-intense services, your organization can benefit significantly from NetWare 4.1 SMP.

Leading the SMP-aware application charge are the database and groupware vendors, some of which provide SMP-aware applications today. Novell also expects future applications in the areas of Internet access, advanced storage management, directory-enabled applications and systems management to be available.

Greater demand for data means that you'll most likely implement or expand your use of resource-intense applications.

Database applications from vendors like Oracle, Sybase and Btrieve Technologies, Inc. leverage NetWare 4.1 SMP to allow the system to handle a greater amount of work. This translates into being able to add more users per server or allowing users to accomplish more on the same server.

Because of their resource-intense nature, groupware applications also greatly benefit from NetWare 4.1 SMP. Today, Novell's E-mail, scheduling and task management software—GroupWise™—is SMP-aware. The product's central component—GroupWise Post Office—takes full advantage of NetWare 4.1 SMP to increase the performance for users who rely heavily on E-mail to communicate. Two additional modules will soon be available that further improve the performance of GroupWise.

Improve Performance of Existing Applications

By adding NetWare 4.1 SMP to a NetWare 4.1 multiprocessing server, you can also realize performance gains with your existing applications. This is because Novell has added multithreading support to the core components and modules that are involved in the underlying functions of NetWare 4.1. These modules include CLIB, ODI, NLSP and RSA encryption. Since these processes are now offloaded from the main processor (processor 0), more overall system capacity is available to handle non-SMP-aware activities. This increased bandwidth enables you to do more on a single server, increasing the capabilities of your computing environment with your existing applications.

Meeting the Growing Demand for Information with NetWare 4.1 SMP

Whether you're planning to meet your company's growing demand for information by adding new SMP-aware applications to your multiprocessing servers or just want to improve the performance of your existing applications while evaluating your future needs, NetWare 4.1 SMP is right for you. The product has the support of the industry's leading application and hardware vendors to provide the solutions you need today and in the future. ■

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NetWare 4.1 SMP—Available from Novell's Partners

To provide tight integration with multi-processing hardware, improve performance, reduce time to market and provide the best possible support, Novell is making NetWare 4.1 SMP available as an OEM product. Novell has partnered with industry-leading hardware platform vendors to provide the most tightly integrated hardware and software solutions possible. These partners have tuned and optimized NetWare 4.1 SMP to ensure compatibility and improve performance on their server platform.

To provide the best possible support, Novell's OEM partners were part of an extensive testing process

The OEM Approach

Company Name	Server Platform Name	Contact Information
Acer	AcerAltos 7000/p Series	800-SEE-ACER
AT&T GIS	AT&T Globalyst S40 Server	800-447-1124
Compaq	Compaq ProLiant 4500 / 4500 R Compaq ProLiant 4000 / 4000 R Compaq ProLiant 2000 / 2000 R	800-345-1518
Dell Computer Corporation	Dell PowerEdge SP Dell PowerEdge XE	800-274-3355
Digitol Equipment Corporation	Priaris Hx 590DP Priaris Hx 5100 MP/2, Hx 5100 MP/4	508-264-6493
Fujitsu ICL	Fujitsu ICL teamserver Fujitsu ICL superserver	44-1B1-565-7997
Hewlett Pockord	HP NetServer 5/100 LH2 HP NetServer 5/133 LH2 HP NetServer 5/100 LS2 HP NetServer 5/100 LS4 HP NetServer 5/133 LS2 HP NetServer 5/133 LS4	800-752-0900
IBM	IBM B640-1YO (IBM PC Server 320) IBM 8640-1YT (IBM PC Server 320) IBM B640-MX0 (IBM PC Server 320) IBM B640-MXT (IBM PC Server 320) IBM 8640-MY0 (IBM PC Server 320) IBM 8640-MYR (IBM PC Server 320) IBM B640-MYT (IBM PC Server 320) IBM 8640-0Y0 (IBM PC Server 320) IBM 8640-OYT (IBM PC Server 320) IBM 8642-0Z0 (IBM PC Server 720) IBM B642-1Z0 (IBM PC Server 720) IBM 8642-2ZS (IBM PC Server 720) IBM B642-4ZS (IBM PC Server 720)	800-772-2227
NetFRAME	NetFRAME ClusterServer 8540 NetFRAME ClusterServer 8520 NetFRAME ClusterServer B510	800-SERVERS
Olivetti	Systema SNX 200/RS Systema SNX 400/RS	509-927 5800
Tricord Systems	Tricard PowerFrame Enterprise Server	612-557-9005
Unisys Corporation	PW2 Advontoge Series Madel SFE PW2 Advantoge Series Rackmaunt Server PW2 Advantage Series Model SME PW2 Advantage Series SVD Duel Processor Pentium Madels	408-434-2848
Zenith Dota Systems	Z-SERVER MX	800-582-0524

and are very familiar with NetWare 4.1 SMP, as well as their hardware configurations. The OEM partners and their reseller's technical support staff will provide support for installation, performance optimization, hardware configuration and other technical issues. Novell will work with its partners to provide support for issues that are related to the NetWare 4.1 SMP operating system.

Choosing a Solution

To help you choose the solution that is best for you, the table above provides important information about Novell's OEM partners and their multiprocessing hardware platforms. Contact information is also provided above so you can begin enjoying the benefits of multiprocessing computing as quickly as possible. ■

For details on NetWare 4.1 SMP and our partners, call 1-800-844-6661. Or, Internet access via http://www.netware.com/partners/smp/smpmenu.htm

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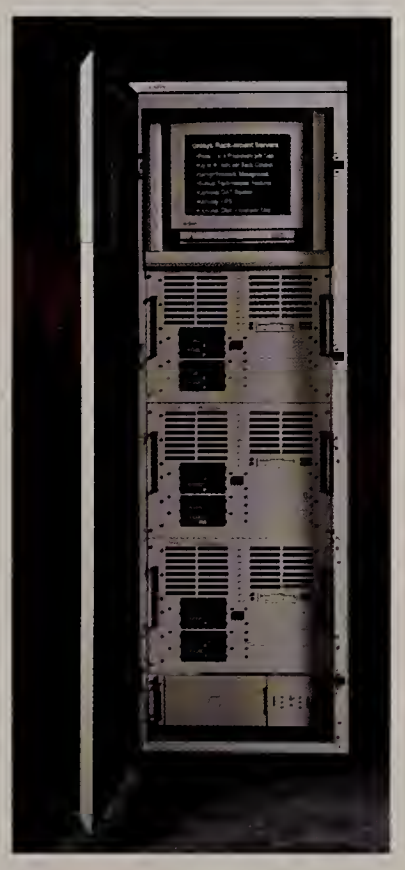

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Briefs

■ **Attachmate Corp.** *last week announced Version 3.1 of its integrated* **IRMA TCP/IP Suite** *that includes a Netscape Navigator Version 1.2 Internet browser, improved terminal emulation graphics displays and simpler desktop installation procedures.*

IRMA TCP/IP Suite provides complete TCP/IP host emulation services for PCs needing access to IBM 3270 or 5250 applications and Digital Equipment Corp. VAX and Unix hosts.

IRMA TCP/IP Suite is available for $265.

Attachmate: (800) 426-6283.

■ **Proginet Corp.** *is offering a* **free license** *of its Fusion LAN-to-mainframe file transfer software to users of Computer Associates International, Inc.'s XCOM and Sterling Software, Inc.'s Connect:Direct file transfer packages. Microsoft Corp. and Proginet jointly developed Fusion, which enables large file transfers between Windows NT and Windows 95 clients and IBM mainframes.*

Proginet: (516) 248-2000.

■ **Seagate Enterprise Management Software, Inc.** *has rolled out software that allows users of its NerveCenter event correlation engine to quickly monitor, diagnose and correct enterprise network problems.*

Called behavior models, the software can reduce the need to configure complex polling, event condition and automated action required to **manage network devices.**

Vendor-independent models are included with NerveCenter; vendor-specific models for Bay Networks, Inc. and Cisco Systems, Inc. gear are included in Seagate Assist, software for trend analysis, fault management and performance monitoring.

The behavior models are shipping now. NerveCenter costs $15,000 for an enterprise license, and Seagate Assist costs $6,000.

Seagate: (408) 342-4500.

Stalled product release eclipsing SunSoft efforts

May be costing the company mind-share in battle with HP.

By Jim Duffy
Mountain View, Calif.

SunSoft, Inc. may be losing momentum in network and systems management because its high-end product will not ship to end users until late 1996.

SunSoft was expected to ship Solstice Enterprise Manager (EM), an object-oriented, distributed management platform, to end users earlier this year, according to analysts, a former SunSoft executive and published reports (*NW,* May 22, page 45). But SunSoft is still in the 1.X release cycle of EM, versions that are only targeted at OEMs and developers.

The end-user release, dubbed EM 2.0, has been pushed out to late 1996 due to complicated product development, according to SunSoft. They would not acknowledge, however, that the product is at least a year behind schedule.

"I'm not sure how to account for that," said Brian Biles, SunSoft's group marketing manager for enterprise management products, when reminded that SunSoft disclosed plans back in January to ship the product this year.

"All 1.X releases are chassis and motor [developments] aimed at OEMs and developers, not the full luxury interior that large IT shops would want," he added.

A former insider disagreed. Denis Yaro, executive vice president of marketing and service development at systems integrator SSDS, Inc., was vice president and general manager of SunSoft's enterprise management products group back in January when SunSoft launched the Solstice product line. Two weeks ago, at the Enterprise Management Summit in Dallas, he reiterated SunSoft's plans at that time to ship EM to end users by mid-1995.

"This stuff has to percolate some more," Yaro said. "It was not as easy as we hoped it would be."

Analysts say SunSoft has been less than forthright about the status of EM and other Solstice products over the past nine months.

"I actually checked my [schedule] and it still says fourth-quarter 1995 for the end-user release [of EM]," said Jim Herman, vice president of Northeast Consulting Resources, Inc. in Boston. "[SunSoft] seems to be engaging in a case of selective amnesia, forgetting that that's when they had promised this thing would be ready."

Others agree. "As I recall, the user version was supposed to have been rolled out quite a while ago, like the middle of this year," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The delay in releasing EM 2.0 seems to be eclipsing any momentum that SunSoft has in network and systems management, Herman and McConnell said. That momentum is due in large part to rival Hewlett-Packard Co.'s slipups with the Tornado version of OpenView (*NW,* Jan. 23, page 1).

But despite HP's problems, SunSoft is losing market share to the company. HP stole the leadership position in enterprise management from SunSoft in the first half of this year, according to the latest figures from International Data Corp. (IDC) in Framingham, Mass.

HP's OpenView now accounts for 35% of the enterprise management platforms shipped to date in 1995, while SunSoft accounts for 33%, IDC reports (see graphic). SunSoft had been the 1994 market leader with a 30% share, while HP had 28%.

Nonetheless, there still might be a ray of hope for SunSoft. EM 2.0 is targeted at HP's Synergy release of OpenView, which is not expected to hit the market until 1997.

But with EM 2.0's delay, SunSoft's window of opportunity is starting to close.

"Whether SunSoft's blown their opportunity or not is hard to say," McConnell said. "They certainly haven't helped themselves." ■

Market shift

HP has vaulted ahead of SunSoft in the number of management platforms shipped, an indication that SunSoft may be losing steam in this market.

SOURCE: IDC, FRAMINGHAM, MASS.

AT&T goes after data networking

By David Rohde
New York

AT&T last week said switched Ethernets will soon be able to give wide-area multimedia calling capability to Unix client workstations. But it will take about a year to extend the same capability to more popular Windows clients.

That was the message for net administrators as AT&T last week unveiled its new Multimedia Communications Exchange (MMCX) server. The announcement signals the highly anticipated foray by the emerging independent AT&T communications equipment firm into full-scale data networking (*NW,* Oct. 23, page 68).

Analysts said the MMCX server is the first product to give users the flexibility to conference-in on- or off-site participants to share a real-time data or video application, while at the same time letting others simply monitor the call by phone.

The server sits on a switched LAN and simultaneously grabs calling features through an ISDN link with AT&T's Definity private branch exchange system. Due for general release in the first quarter of 1996, it will support up to 20 conferences of six endpoints each. A second release supporting the T.120 conferencing standard in addition to Windows clients is due by the end of next year.

Version 1 of the MMCX is already used by McDonald's Corp. to share store designs among headquarters staff in Oak Brook, Ill., and a regional office

See **AT&T GBCS,** *page 25*

STEVE BORNS

Top executives *of Cisco, Bay, Cabletron, 3Com, HP and Insoft last week joined a team from AT&T Global Business Communications Systems headed by GBCS President Patricia Russo (middle row, left) to introduce the Multimedia Communications Exchange server at New York's Museum of Television and Radio.*

Network World Fusion

Grab technical specs and diagrams related to T.120, a videoconferencing standard, from Network World Fusion. Link to http://www.nwfusion.com. From the main menu, select News+ then WANS & Internetworking.

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Net analysis

Frame relay cruises down the info highway

By Tim Greene

To cope with the boom in business and the resulting slowdown in response times, Internet service providers are injecting frame relay switching into their network backbones.

Besides speeding performance, the switching also lets the companies offer users virtual private internets. Most recently, UUNET Technologies, Inc. and Netcom On-Line Communication Services, Inc. bought frame relay switches from Cascade Communications Corp.

Other providers have been using frame relay longer and have developed other services. PSI International, Inc., for example, has had Cascade frame relay switches in its network since 1992 and today offers its InterFrame service of permanent virtual circuits (PVC). CompuServe, Inc. uses its StrataCom, Inc. frame relay switches, in place since the late 1980s, to enable IP Link, its virtual private IP network service introduced earlier this year.

A 60-40 split

CompuServe's network traffic is made up of about 60% frame relay and 40% X.25 over its StrataCom IPX switches.

The architecture of many Internet service providers' networks consists of T-3 dedicated lines tying together network routers. But frame relay switches are a way to speed up those nets and improve reliability, according to Tim Wilson, a senior consultant for Decisys, Inc., a consultancy in Sterling, Va.

Kevin Boyne of UUNET said his company started putting Cascade B-STDX frame relay switches into its backbone last spring, giving UUNET switching ability that it had previously leased from telephone carriers.

"As we grew, we decided we needed our own for scalability and quality," Boyne said.

Users could notice faster response times, depending on where they are transferring data to and from. "If you are connecting with a fast service over the Internet, you will notice an improvement," he said. If you are connecting with a slower site outside the UUNET network, "You can wait faster."

PSINet has had frame relay in its network since 1992. "As we started to grow, the router-to-router infrastructure was becoming a management problem," said Jeff Shapard, senior product manager for PSINet's corporate services marketing.

Beyond that, it became a performance problem. "You end up having a large number of hops from one side of the network to the other, and that degrades performance," he said.

PSINet now has between 80 and 100 switches in its net designed to get traffic to a switch in one hop, send it across the T-3 ATM backbone and deliver it to a router one hop from the user.

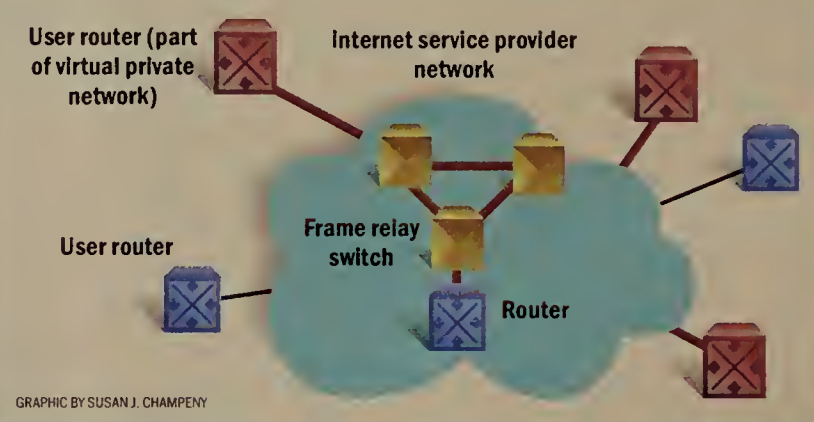
The switches let PSINet manage the individual user's traffic over PVCs. For example, the switches can throttle back a Usenet feed if the user has a more important file transfer coming in from a business partner.

They can also sort out inbound traffic headed for a corporate World-Wide Web site from intracorporate communications and give the internal traffic priority.

The switches also let PSINet offer PVCs among remote offices or business partners to establish virtual private internets within the PSINet network.■

Not just routers anymore

Internet access providers are adding switches to their network fabrics to improve network performance and add service features.



GRAPHIC BY SUSAN J. CHAMPENY

Netlink FRAD upgrade boosts LAN, SNA delivery

By Michael Cooney

Framingham, Mass.

Netlink, Inc. this week will introduce new software for its central-site frame relay access device (FRAD) that promises fast, reliable delivery of SNA and LAN traffic from remote offices.

The software, called SafeLinx, runs on Netlink's OmniLinx FRAD and features control techniques that let users control bandwidth and prioritize mixed LAN and SNA traffic. The new features will guarantee the performance of mission-critical applications on frame relay nets.

"First-generation SNA FRADs really haven't addressed response-time consistency or bandwidth allocation issues, which has deterred users from migrating large leased-line SNA network users to frame relay," said Roger Walton, vice president of marketing with Netlink. "With over 60% of U.S. data traffic still SNA-based, there is a need and a market for intelligent FRAD devices."

Netlink is positioning SafeLinx to change that discrepancy. The product supports two new features, Adaptive Burst Rate and Multi-level Bandwidth Allocation, that help users adjust bandwidth and eliminate performance bottlenecks.

Adaptive Burst Rate controls the frame relay "burst window." This lets traffic associated with large TCP/IP file-transfer or client/server applications get through the same frame relay committed information rate (CIR) pipe as SNA traffic without squeezing SNA traffic out. This feature can sense when traffic needs to burst above a particular CIR and control that traffic, as well. It can then throttle back when necessary.

Let's get specific

Multi-level Bandwidth Allocation lets users prioritize traffic by specific device. For example, for an SNA application, users can designate a certain SNA physical unit to have bandwidth priority over other SNA physical units in the net. Conversely, for TCP/IP traffic, users can set specific ports or sockets as having higher priority or more bandwidth allocation than other devices.

"The new OmniLinx features ensure consistent, reliable response times for mission-critical SNA applications, while letting users fully exploit frame relay capabilities," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

Others noted that SafeLinx's features bring Netlink in line with other FRAD vendors, such as Hypercom, Inc., that have prioritization and bandwidth allocation support in their FRADs.

The SafeLinx software runs on Netlink's OmniLinx 4000 hardware. In its base configuration, the OmniLinx 4000 can support two T-1s and two LAN interfaces, either token ring or Ethernet.

The box can be expanded to support as many as eight T-1s. OmniLinx is positioned as a central-site FRAD, linking multiple sites running TurboFRAD, Netlink's remote branch-office device that already runs SafeLinx software.

The box is compliant with IETF RFC 1490, so it can link to any other RFC 1490-compliant box. RFC 1490 defines how multiprotocol devices communicate over frame relay nets.

Also, the OmniLinx 4000 can be managed either via a host-based NetView system or from any Simple Network Management Protocol-based platform.

OmniLinx 4000 with SafeLinx software is available now starting at $4,000. Existing users can upgrade for $600.

✆Netlink: (508) 879-6306.

Public network integration to pay user dividends

By Joanie Wexler

The prognosis for getting consistent network service levels across multiple carriers' systems, and do so at a reasonable price, improved last week.

An ongoing effort by the Network Management Forum (NMF) to automate and integrate carriers' service management systems has yielded a set of standards called OmniPoint 2. These standards take technical specifications previously nailed down by the NMF and bundle them with new global implementors' agreements.

The packages are known collectively as solution sets. They are intended to plug potential gaps in service consistency, lower the cost of delivering service, and help carriers get services to market more quickly.

Each set will work by describing a specific business requirement, such as service ordering, billing, trouble-ticketing or bandwidth management (see graphic), as well as the technical implementation needed in equipment supporting that function. Six sets are available now, and four more are to be ready in 1996.

This behind-the-scenes work by carriers to get their systems communicating in a common, automated way should result in faster service delivery and lower prices for users — provided most carriers and their suppliers buy in.

Global carrier MCI Communications Co. and systems suppliers Hewlett-Packard Co., Newbridge Networks, Inc., Ericsson L.M. and Ascom are among those who have hopped on the OmniPoint bandwagon, according to Keith Willets, NMF president and head of market development at British Telecommunications plc. The regional

See **Integration,** ***page 25***

Speaking the same language

These six solution sets for getting carriers' systems to talk to one another are complete; four more will emerge in 1996.

Solution set	Description
Multinetwork Bandwidth Management	Allows dynamic changing of bandwidth from a single management system (including customers') across any net type.
Leased Circuit Management	Ties together carrier and customer management systems so they can share data such as performance and alarm reports.
Switched Service Feature Administration	Automates process of changing a customer's line record in multivendor switches.
Switch Interconnection Management	Provides a common way of managing a network of switches and network connections.
Generic Alarm Monitoring	Provides a general-purpose alarm; should save time in problem-solving.
LAN Alarm Interface	Enables a CMIP-based management system to monitor SNMP-based alarms.

SOURCE: NETWORK MANAGEMENT FORUM, MORRISTOWN, N.J.

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NET MONITOR

FCC blesses carrier price collusion

Hi, MCI? Your friends at AT&T here. Just wanted to let you know about our upcoming changes to our frame relay rates. Thought you might want to follow our lead. Silly to have secrets or real price competition between friends. After all, this is the communications industry."

Sound improbable? Well, it isn't. In fact, the FCC has given its official blessing to this type of frame relay price collusion by mandating that each carrier file a frame relay tariff.

The move flies in the face of the government's desire to foster the growth of the information superhighway. You see, adding a tariff requirement for frame relay services is the first step toward mandating tariffs for ATM and other public data offerings, as well.

What does this mean for the superhighway? A 2-foot-tall speed bump across all six lanes, followed by a meandering detour through downtown Washington, D.C. According to the ruling, every frame relay service provider now has to file tariffs. Of course, it makes little difference that the major carriers made frame relay rates public this year. A rate sheet is just a page or two of the white stuff, with no THUNK value when it's dropped on someone's desk. A tariff, now there's an impressive THUNK!

Here are a few of the impacts of this brilliant decision:

■ The carrier's cost of providing frame relay will now increase. After all, a lot of important people have to read and approve a tariff. Oh, and there are lots of expensive lawyers, too.

■ It will take a long time for carriers to adjust pricing to keep pace with market changes. After all, the government needs plenty of advanced warning about how the free market is going to adjust to changes in supply and demand.

■ The cost of frame relay services will eventually rise. Why not? Each carrier can now signal — and well in advance — any planned increases in pricing. This way, one provider can subtly ask all the other providers, "Hey, if I raise my prices a few percentage points, will you follow?" If you don't believe this, just look at the upward trend in private-line pricing over the last four years.

Daniel Briere and Christine Heckart

In fairness, the top 1% of users benefit from tariffs. These are the users with enough buying power to negotiate custom tariff deals.

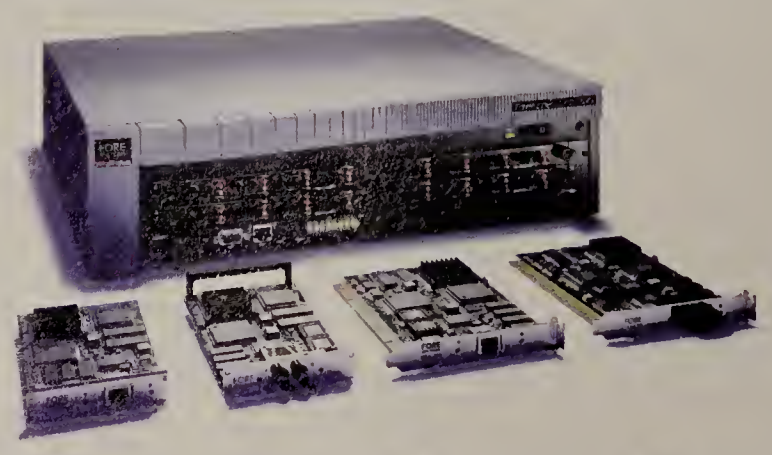
The other 99% of customers don't gain from this process. In a free market, even relatively small end users can play one carrier off of another during the standard bidding process, and they may squeeze out a few additional concessions or discount points. These users will lose the ability to bargain the price down.

Carriers cannot afford to create custom tariffs for the middle market; it is too expensive a process. They will create custom tariffs for the largest users, but as this increases the carrier's cost of doing business, it reduces profit margins and over time results in a need to increase pricing. Who pays? The small or midsize user that has to buy directly off of the tariff.

The very behavior that tariffs were originally designed to eliminate, namely price collusion, is precisely the behavior that tariffing creates.

Hello? Is anybody home?

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at danny_briere@telechoice.com or christine_heckart@telechoice.com. They share this space with Scott Bradner, whose column will appear next week.



The people who invented Desktop ATM just re-invented the price.

Desktop 100 and 155. As low as $500 per adapter and $1000 per switch port.

Now you can get the performance of ATM at the price you've been waiting for. With Desktop ATM from FORE.

Start for as little as $1,500—$500 per adapter and $1,000 per switch port. Choose Desktop 100 or 155. Copper or fiber. For PCs, Macs, and UNIX workstations. And you'll get the unmatched advantages of ATM—speed, scalability, and quality of service.

Best of all, the company breaking the ATM price barrier is FORE, the leader in ATM technology with more LAN switch ports installed than all other competitors combined.

So why settle for lower performance alternatives? Call 1-412-933-6244 today to connect with ATM for as little as $1,500. It's a small price to pay for the ultimate in network performance.

FORE SYSTEMS

At the Forefront of ATM Networking

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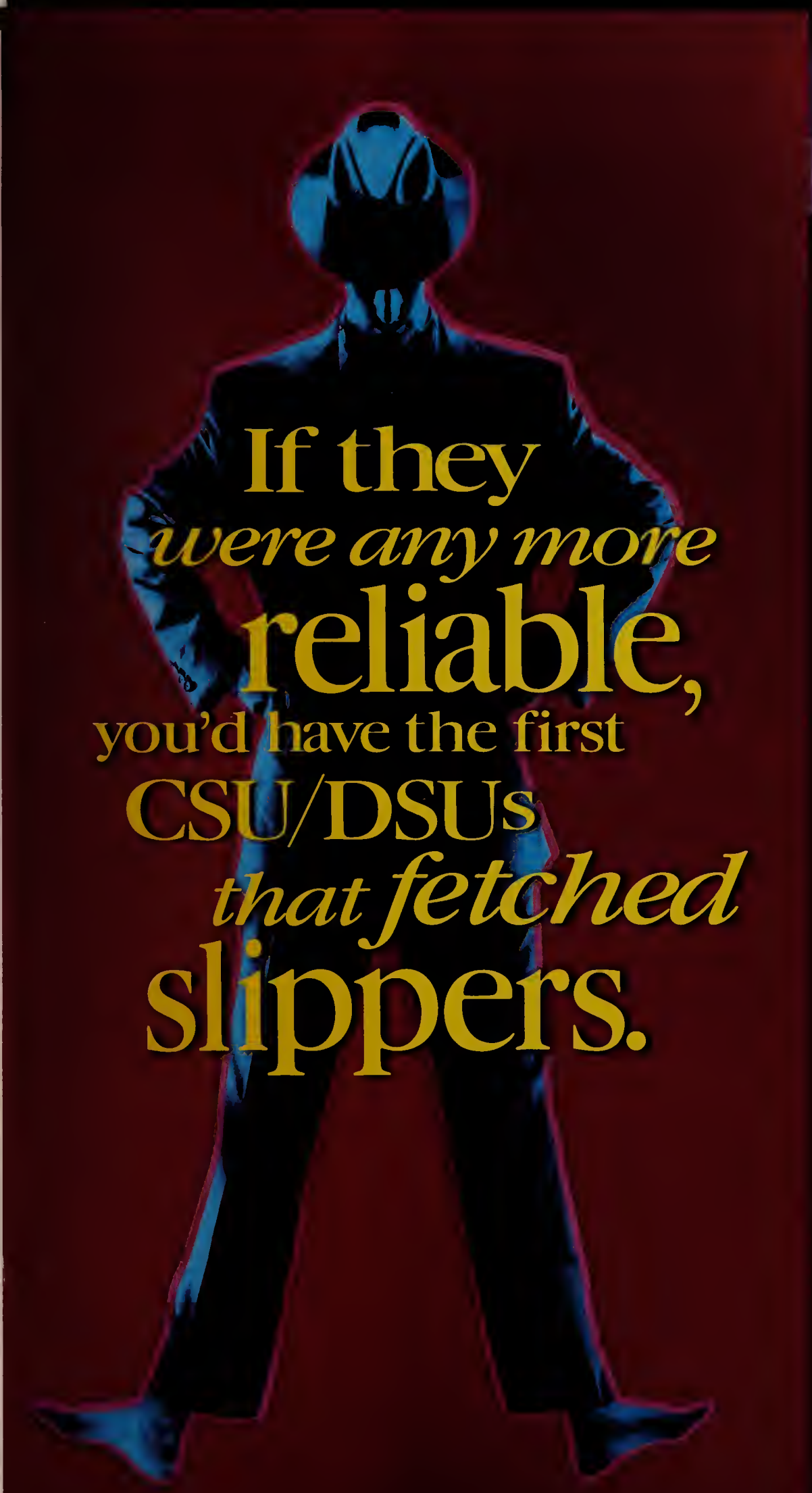

If they *were any more* reliable, you'd have the first CSU/DSUs *that fetched* slippers.

It's not like they're man's best friend, but they will keep you out of the dog house.

Run the ever-reliable AT&T Paradyne CSU/DSUs and you'll notice a sudden decline in office cursing and maybe even get a pat on the back. Because consumers ranked our CSU/DSUs No. 1 in customer satisfaction in IDC's Key Influencers in the purchase of digital access products. And they did it again when we dominated ComputerWorld readers' I/S Brand Preference Study. It actually made us rather proud because we won categories like: Best Technology, Best Price/Performance, Best Service and Support and Most Preferred to do Business With.

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So you know *which* CSU/DSUs to buy, but what about *when* to buy them? Well if you're not using a CSU/DSU that connects you to the latest network services, you probably aren't running as efficiently as you could be. And that's bad. Our reseller network specialists would be glad to discuss your system requirements and help you find a more economical solution. Just give us a call at 800 482-3333 ext. 329.

Want some free goods? Find your phone. *Call 800 482-3333 ext. 329* to make an appointment and get your free *"Everything you ever needed to know about CSU/DSUs, but didn't really know who to ask"* kit. Full of lots of good stuff to get you on your way to being connected. Or find us on the 'net: http://www.paradyne.att.com.

AT&T Paradyne

To fetch the *free stuff*, turn back.

The broadest line of CSU/DSUs, from subrate to T1

ACCULINK® 3100 Family of T1 CSU/DSUs

For customers who want to connect their router network at speeds higher than 56K from a single T1 link.

- Cost effective, high-speed access
- One-, two-, and four-port models
- E1A-530, RS-449 or V.35 data transmission
- Standard DSX-1 drop-and-insert port (letting voice and data share a single line) on two- and four-port models

COMSPHERE® 3615 DSU

For customers with routers connecting to Frame Relay networks, it provides, (1) an integrated dial module (PSTN or SW56) for dialing around a failed Frame Relay access link and a diagnostic path for the DSU and router, (2) Bandwidth-on-Demand with a second SW56 link for the router, or (3) disaster recovery, giving a back-up SW56 path for the router to its closest peer router or recovery site.

- Unsurpassed flexibility and reliability
- Standalone or carrier card versions
- 2/4 wire SW56 Kbps versions

COMSPHERE 3550 DSU

For customers who want an economical, multirate DSU with full remote network management capabilities.

- Easy to install
- Superior reliability
- Standalone or carrier card versions
- Support for standard IBM multiport SNA applications

COMSPHERE 3510 DSU

For customers who want a low-priced, multirate DSU for applications that don't require centralized network management.

- Standalone or carrier card versions
- Flexible point-to-point and multipoint operations
- Fault isolation through standard Loopback diagnostic tests

AT&T Paradyne

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ntegration

ontinued from page 20

ell operating companies have een slower, but they may be oming around.

NYNEX Corp. is encouraged y International Telecommuni- ations Union standards in- luded in OmniPoint 2.

"That will make implementa- on more possible. We may take dvantage of them," said Hamid odarressi, executive direc- r of NYNEX science and tech- ology.

A measure of NYNEX's dis- nce from OmniPoint is that it is ot a member of NMF. Rather, it es through its switch vendor, ewbridge, which is a member.

BOCs' stance

The RBOCs are likely to put place automated services anagement standards with her carriers as they become regulated and enter the long- istance market.

Other local service providers – such as GTE Corp., which ready has a global presence, d Bell Atlantic Corp. — have so seen the light.

"Going forward, the service roviders have to use standard terfaces [among systems]," id Bernie Maier, manager systems planning at Bell tlantic, a staunch OmniPoint pporter.

"Otherwise, in the long run, it costs us more to provide service, it will delay service, and we won't be able to accommodate users who want to do their own provisioning," Maier said.

For its part, AT&T has been implementing bilateral agreements with each member of its WorldPartners Alliance.

The company had no comment on OmniPoint per se, but "tight partnerships are costly and time-consuming," said Richard Bodman, AT&T senior vice president for corporate strategy and development in an interview with *Network World* last week.

"AT&T is very interested in standards for getting carriers and users to interconnect," he added.

When different carriers' systems don't talk to each other, "you can't keep tabs on the quality of service you're offering," said Elizabeth Adams, NMF managing director.

Willets pointed out that many carriers, and the RBOCs in particular, have been on a downsizing kick to trim costs. "But you can't do that ad infinitum. You need to do things 'smarter' at some point."

He anticipates it will take two to four years before OmniPoint standards are implemented widely enough across platforms to be useful. n

BusinessBriefs

sco Systems, Inc. announced an greement to purchase **Network Transla- n, Inc.**, a privately held maker of net- rk address translation and Internet ewall equipment.

The investment is intended to oaden Cisco's offerings for users that ed to map between private network dresses and Internet addresses.

Financial terms of the deal were not closed. The transaction is expected to se by the end of this month.

ur former **LEGENT Corp.** executives ll lead French software developer **Nat stems, Inc.'s** move to the U.S. this l. The executives, who include former EGENT Chief Executive Officer John Bur- , will help move the company's head- arters from Paris to Reston, Va. Nat stems builds software development l kits, including products for the crosoft Corp. Windows environment. rton and the other executives left GENT when it was bought by Com- ter Associates International, Inc. this mmer.

Fore Systems, Inc. and **Premisys Communications, Inc.** last week announced a collaboration to come up with ways to integrate data, voice and video traffic from traditional premises equipment over Asynchronous Transfer Mode wide-area links (*NW*, Sept. 18, page 1). Fore will sell Premisys' IMACS ATM concentrator, and the companies will work toward incorporating the Fore ForeThought networking software's switched virtual circuit capabilities.

Network Express has signed a definitive agreement to acquire **Fivemere, Ltd.**, an Aldershot, England-based provider of ISDN products.

Fivemere has an installed base of 10,000 sites in 20 countries for its ISDN digital circuit backup equipment. The company had revenue of $8.6 million in 1994.

Network Express said the Fivemere buy will broaden its geographical revenue base and help it tap the financial services market. The deal is expected to conclude by the end of this month.

Livingston touts lower priced ISDN products

May force competitors to also consider using AT&T chip.

By Jim Duffy

Pleasanton, Calif.

Livingston Enterprises, Inc. last week announced three new ISDN remote access products that it claims cost thousands of dollars less than competitive offerings, courtesy of a new hardware implementation.

Livingston unveiled an end-to-end ISDN offering that includes central-site, branch-office and desktop routing products for IP and IPX networks. The products are the first to use AT&T's new T7903 ISA-Multiport Wide Area Connection ISDN chip, which incorporates ISDN functionality on a single integrated circuit, said Bruce Byrd, Livingston director of marketing.

For the central site, Livingston rolled out PortMaster ISDN Communications Server, which offer five or 10 ISDN Basic Rate Interfaces to support as many as 20 concurrent users or remote site LANs.

For the branch office, Livingston unwrapped PortMaster ISDN Office Router, which features one ISDN BRI.

And for the individual user at the small or home office, the company brought out PowerLink128 ISDN Modem, a card for ISA-based personal computers that connects users to ISDN services via a single BRI.

AT&T helps cost cause

Byrd claims these products are priced from $100 to as much as $6,000 less than offerings from Ascend Communications Corp., Cisco Systems, Inc., Telebit Corp., 3Com Corp. and Xylogics, Inc. Analysts say the dramatic savings are due to the AT&T chip.

"Most of Livingston's competitors have their own silicon, but they're going to have to look at [the AT&T device]," said Michael Howard, president of Infonetics Research Institute, Inc. in San Jose, Calif. "It provides a new lower price point for all of them to match."

While pricing might attract some users, others would be interested anyway because they need to upgrade their transmission facilities.

"We have a lot of people doing high-intensity stuff over 14.4K and 28.8K bit/sec [connections], and they get pretty upset" with performance, said John Thompson, senior systems administrator at Amdahl Corp. in Sunnyvale, Calif.

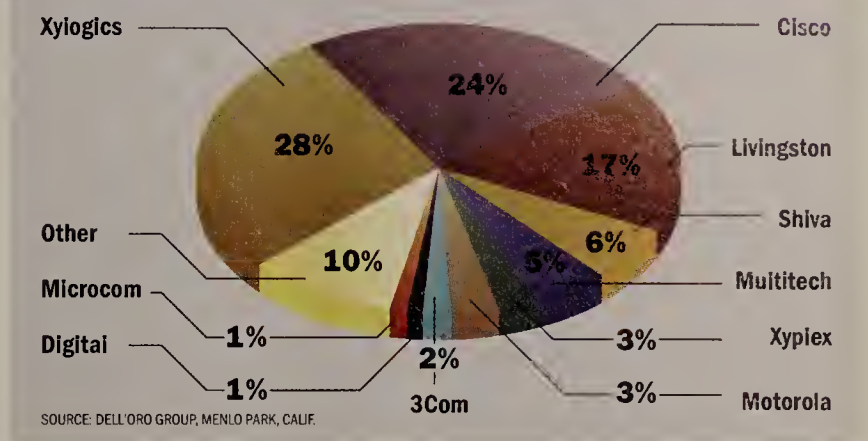
Prices for PortMaster ISDN Communications Server start at $4,690. It will be available later this month.

PortMaster ISDN Office Router, meanwhile, costs $1,195, while PowerLink128 ISDN Modem is tagged at $299. Both products will be available in December.

& Livingston: (800) 458-9966.

Remote control

Remote node port shipments (greater than 3 ports) in the first half of 1995



SOURCE: DELL'ORO GROUP, MENLO PARK, CALIF.

AT&T GBCS

Continued from page 17

in Fairfax, Va., chopping out the delay involved with shipping diskettes and hard copies. McDonald's can conference-in lawyers or other outside professionals simply by telephone, said AT&T staffers who have worked on the project.

Because client support in Version 1 is limited to Hewlett-Packard Co. and Sun Microsystems, Inc. Unix workstations, AT&T initially will target the new server to high-performance users.

The long-term goal laid out by GBCS President Patricia Russo is to enable users to "purchase and manage a single enterprise network instead of two."

But the long-term goal laid out at a press conference here by Patricia Russo, president of AT&T's Global Business Communications Systems (GBCS) unit, is to enable users to "purchase and manage a single enterprise network instead of two" — one for data and one for voice.

To move toward this goal, each potential user's record within the MMCX server is associated with all conceivable types of addressing. "We're giving a phone number to the desktop and relating it to the IP address," said Karyn Mashima, vice president for advanced communications systems at GBCS. Ultimately, the company hopes to build unified directory services for customers' voice and data applications, she added.

AT&T officials contrasted their approach with that of Northern Telecom, Inc., which has built a line of Asynchronous Transfer Mode switches under the Magellan banner separate from its Meridian 1 PBXs and Digital Multiplex Switching central office systems. "Nortel's strategy is essentially a data-only strategy," said Carl Pavarini, vice president of GBCS.

The MMCX server supports switched Ethernet and ATM platforms from Bay Networks, Inc., Cabletron Corp., Cisco Systems, Inc. and 3Com Corp., each of whom last week said it was partnering with AT&T to advance the multimedia effort. AT&T officials said they were not yet prepared to make a commitment to support switched token ring.

AT&T is insisting on the guaranteed bandwidth afforded by switched rather than shared LAN protocols to protect the quality of service, said Kevin Oye, director of strategic planning and business development for GBCS. In turn, router and hub vendors are looking to bring the voice network's ease of call setup to data applications, said Mike Levy, senior vice president of advanced market development for Bay.

AT&T will provide the hardware — an industrial-class Pentium server with specialized boards — as well as server and client software for a cost of $35,000 to $80,000. Video endpoint gear will be provided by InSoft, Inc. n

Free At Last

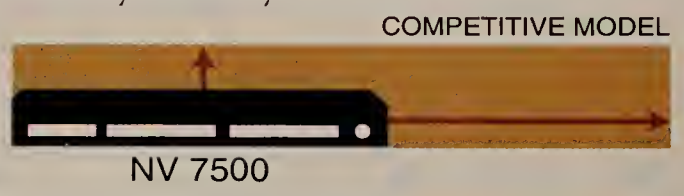
Advanced Ethernet Switching Is Now Affordable For Everyone.

Innovation Lowers The Cost of Performance.

If you're caged in by bandwidth constraints, but can't justify Ethernet switches at $6,000 to $10,000 per unit, freedom is finally at hand. The key: the NV7500 from NetVantage. It combines sophisticated VLSI technology and elegant engineering to deliver the high-end performance you need for only $1,595. And as thousands of installed units have demonstrated, innovation also delivers high reliability.

Smaller, Simpler, Smarter.

Despite its small price and small size, the NV7500 packs the advanced features normally available in only the most expensive switches: features such as error-free architecture (with a 120,000 frame-per-second forwarding rate), Spanning Tree IEEE 802.1d support, SNMP management and easy scalability.



It even trumps the competition with advantages like interface modularity and a 16,000-address capacity.

Interface Options For Investment Protection.

In its base configuration, the unit is a fully featured 8-port 10BASE-T switch — designed to evolve with your network requirements.

A choice of interface option cards allows plug-and-play migration to FDDI 100 BASE-T ATM 100BASE-T, FDDI or ATM for as little as $699.

Stackable To 64 Ports.

Hands down, the NV7500 is the value leader in workgroup switching, but is not limited to that role. A stacking ring option enables easy growth for backbone applications in multi-vendor networks. A maximum stack of 8 units (64 ports) is manageable as a single switch, with no performance degradation.

With the NV7500, NetVantage proves that high-performance switching needn't be a costly investment — nor a risky one. Just ask about the NetVantage "No-Risk" start. It will launch your flight to bandwidth freedom with a 30-day free trial.

THE NO-RISK START

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NetVantage

Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **ISDN*tek** *next week will announce a suite of credit card-sized PC adapters that support ISDN Basic Rate Interface links and will include network drivers for Internet access, remote LAN access and several call-center protocols. The cards are priced starting at $395.*

*ISDN*tek: (415) 712-3000.*

■ **Hewlett-Packard Co.** *last week unveiled a* **scanner** *that can attach directly to a token-ring or Ethernet network running Novell, Inc. NetWare. The HP ScanJet 4Si, which can scan as many as 15 pages per minute, eliminates the need to dedicate a networked PC to a scanner.*

The scanner is priced at $2,995 for Ethernet and $3,199 for token-ring nets.

HP: (800) 752-0900.

■ **Integrix, Inc.** *of Newbury Park, Calif., last week unveiled two scalable processor architecture (SPARC)-based* **Internet servers** *at Internet World in Boston. The CS20E and CS1000 servers are designed for companies that want to give end users access to the Internet from their desktops as well as for Internet service providers. The servers run Solaris 2.4 and feature both Ethernet and ISDN connections.*

The CS20E base configuration is priced at $8,995. An optional SEC160 expansion chassis, which offers room for another six interface cards, is priced at $1,995. The higher end CS1000 starts at $17,995.

Integrix: (800) 300-8288.

■ **Agile Networks, Inc.** *last week said that its ATMizer 125* **Asynchronous Transfer Mode switch** *has passed interoperability testing with ATM-attached routers from Bay Networks, Inc. and Cisco Systems, Inc. Interoperability between routers and ATM switches is key to running ATM-based virtual LANs. Testing was conducted at the New Hampshire Interoperability Lab and at several customer sites using 155M bit/sec ATM links between Agile's switch and routers that served to connect different VLANs.*

Agile: (508) 263-3600.

Products from third parties enhance VINES

By Peggy Watt
San Jose, Calif.

Banyan Systems, Inc. and Attachmate Corp. last week announced a joint development and marketing agreement for enterprise connectivity products, heading a string of VINES-related product introductions at the annual Association of Banyan Users International (ABUI) conference here.

Banyan will license and resell Attachmate's ZIP SNA gateway product and EXTRA Personal Client for Windows.

EXTRA, available for Microsoft Corp. Windows 3.X, Windows 95 and Windows NT, gives desktop users basic browsing and bookmark tools to access the Internet, mainframes, and Unix

See **VINES,** *page 28*

LAN MANAGEMENT MIX

Product	Description	Price	Availability
Intel LANDesk Server Manager Pro	Supports NetWare and Windows NT servers; integrates with Microsoft's Systems Management Server.	$1,499	Nov. 18
Intel LANDesk Workgroup Manager	"Lite" tool for managing small Windows NT and NetWare environments.	$999 per server for 30 nodes	Now
Intel LANDesk Virus Protect	Preview of comprehensive scanning product.	Free through the Web; full scanning product upgrade available in 1996	First half of 1996
Novell Managewise 2.0	LAN management tool upgrade that includes NDS integration; better SNMP support; links to OpenView, NetView, SunNet Manager; performance history database; remote management capabilities.	$795 for five users; $12,995 for 1,000 users	Now

Intel tries its hand at NT management

By Kevin Fogarty and Ben Heskett

In a move designed to cement its place as a leading LAN management vendor, Intel Corp. last week announced it would add Windows NT management capabilities to its NetWare-centric LANDesk Manager suite.

As expected, the company will ship a Windows NT server monitoring agent and a cut-down version of LANDesk Manager for small NT nets by the end of next year. It also will ship a full-function Windows NT LANDesk Manager suite next year (*NW,* Oct. 30, page 1).

Intel's announcements followed by just one week Novell, Inc.'s long-awaited rollout of Managewise 2.0, an enhanced version of the NetWare management bundle made up of LANDesk Manager and Novell's NetWare Management Service (*NW,* Oct. 23, page 1).

The recent Managewise version includes greater use of NetWare 4.1 features but adds little from Intel, which has suddenly increased its focus on management of Microsoft Corp. nets.

"Intel sees the need to bridge [NetWare and NT], which is something other vendors are looking to do, too," said Clare Garry, an analyst with the Gartner Group, Inc. consultancy in San Jose, Calif. "That gives Intel a better chance in the market."

Intel entered the management market with some trepidation and allied with Novell to give it something to fall back on in case LANDesk Manager failed to win on its own, according to Garry. Now that Intel has become a leading LAN management vendor, the company is expanding its efforts by focusing on heterogeneous LAN environments, she said.

See **Intel,** *page 30*

3Com adds RMON across its line

By Michael Csenger
Santa Clara, Calif.

Accepting the challenge to tie together its assorted acquired product lines, 3Com Corp. today will introduce tools that unify the monitoring and troubleshooting of all 3Com net elements.

The company is integrating Remote Monitoring (RMON) support across all of its product offerings — extending the RMON-like SmartAgents that have resided on 3Com-designed products over the past 18 months. 3Com is also rolling out the RMON Client Application for its Transcend network management system.

Users of Transcend will be able to gather information collected by RMON agents on original 3Com gear as well as on products from Chipcom Corp. and other 3Com acquisitions that already support RMON.

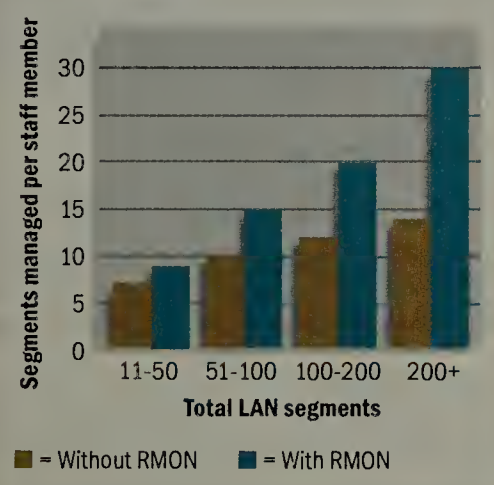
The new Transcend application is based on Axon Corp.'s software, which has been integrated into Unix 3.I and Windows 4.I versions of the 3Com management platform.

"This is going to save us a lot of time and money," said Michael Green, director of technology for Williams-Sonoma, Inc., a retailer based in San Francisco. Green installed the RMON software about two weeks ago, and said it provides an excellent overall view of his 3Com equipment-based net.

See **3Com,** *page 33*

The RMON advantage

RMON monitoring and analysis lets net management staffs oversee more users and LAN segments.



GRAPHIC BY TERRI MITCHELL SOURCE: MCCONNELL CONSULTING, BOULDER, COLO.

LAN management product pileup

Independent of the intriguing Intel Corp. and Novell, Inc. LAN management announcements, ON Technology and McAfee have each introduced new versions of their LAN management tools.

ON Technology of Cambridge, Mass., aired Audit-Track 2.5, an updated software auditing package.

The server-based software, which lets users track software usage across a net, can now be used to export report data to files and combine audit report printouts from various sites. Version 2.5 costs from $595 for 25 users to $4,995 for 1,000 users.

Separately, McAfee announced Saber LAN Workstation 5.5, a new version of the LAN tool obtained as part of the Saber Software acquisition in August.

The latest version of the software combines Saber's existing desktop management technology with McAfee's SiteMeter metering software, SiteExpress software distribution, NetRemote remote control software and ServerStor backup management module, which was recently purchased from Mountain Network Solutions.

Saber LAN Workstation is now available for $47.50 per node for 1,000 nodes.

ON Technology: (800) 767-6683; McAfee (408) 988-3832.

Ben Heskett

NetPro takes on NDS management

Company grows beyond its Banyan roots and makes the move into the Novell arena.

By Kevin Fogarty
Scottsdale, Ariz.

NetPro Computing, Inc., which has roots in the Banyan Systems, Inc. VINES management market, last week announced its move into the Novell, Inc. NetWare arena.

MORE ON-LINE

Network World Fusion is your directory for more information on NDS, including:

- **How to restore NDS files after a crash**
- **A look at Novell's plans for NDS**
- **An administrator's diary of upgrading to NetWare 4.X**

Link to http://www.nwfusion.com. From the main menu, select News+ then Local Networks.

The company has begun shipping a utility called DS Expert that monitors and troubleshoots Novell's directories based on NetWare Directory Services (NDS). The Novell technology is a distributed database of information concerning users and resources on a NetWare 4.X network.

The database is divided into sections called partitions, each of which can be replicated to multiple servers for redundancy's sake.

While distributing replicas improves network performance, the process of tracking them and making sure they are up-to-date can be difficult.

DS Expert is designed to address this issue. The product consists of a Windows-based console and server-based agents that feed information about the status of NetWare directories to the console.

It allows users to simultaneously view multiple partitions and check them for corruption or synchronization problems. It monitors the replication process and sends an alert if the process is interrupted.

DS Expert also keeps track of the number of replicas that exist of each partition and notifies net managers if there are too few backup copies or if a server is housing too many replicas.

The management software can also help net managers pin down the source of a problem using a tracing function called Multi-Server DS Trace.

The product could fill a need for NDS users, who have praised the directory service technology but have criticized Novell for its lack of NDS management tools.

Novell has released a number of NDS management utilities but has left the market mainly to third parties such as NetPro and Preferred Systems, Inc., the latter of which shipped the first NDS management utility.

DS Expert costs $1,299, which includes agents for two servers as well as the console software. Additional agents cost $499.

Separately, NetPro released Admin ToolBox 3.0 for Windows, an update to its flagship product of utilities for VINES administration.

This version is Windows 3.X-based, adds 28 new utilities and can process 25,000 StreetTalk names at once, up from 3,000 in the previous release, according to Corbin Glowacki, product manager.

Pricing starts at $1,406 for the first 200 users.

NetPro: (800) 998-5090.

Senior Editor Peggy Watt contributed to this story.

VINES

Continued from page 27

and VAX systems. ZIP SNA provides mainframe access from LANs.

Attachmate will provide technical support for Banyan's channel partners, and both of the companies will evolve the products. The agreement builds on a similar arrangement for Banyan to resell host connectivity products from Digital Communications Associates, Inc., which Attachmate acquired.

Around ABUI

In other ABUI news, LANshark Systems, Inc. of Columbus, Ohio, released CD-Direct for Windows NT, a CD-ROM redirector, and an update to its Sharkmail E-mail for VINES.

CD-Direct integrates Windows NT servers into VINES so users can share CD-ROMs across environments, said Scott Sharkey, LANshark president and chief executive officer.

The product surpasses the 2G-byte limit of most VINES CD-ROM products, and pricing begins at $995 for 10 connections.

ABUI is opening a new Web site at http://www.abui.org, providing ongoing forums with Banyan executives as well as information about the company and user group activities.

Sharkmail III complies with Microsoft's Messaging Application Programming Interface (MAPI) so users can mail-enable MAPI applications. The product also supports Lotus Development Corp.'s Notes, so users can employ Sharkmail as their Notes interface. The update includes Sharkmail Remote, a remote access component, and synchronization and encryption functions. Sharkmail III pricing begins at $1,195 for a 25-mailbox license.

Fastlane Technologies, Inc. of Nepean, Ont., introduced the Windows-based network administration tools Final 4.0 and NetWizz.

The company has added more than 120 modules, including new FTP and TCP/IP ones that let net managers build their own management applications. The price drops from $4,425 to $895 with this version, scheduled to ship in January.

NetWizz provides user management functions so net managers can change user profiles and attributes.

It is priced at $99. Version 2.0, scheduled to ship in January, also provides enhanced custom programming functions.

Incognito Software, Inc. of Vancouver introduced Web Server for VINES 1.0, completing its suite of Internet tools and applications for VINES.

The product provides secure connectivity, including a built-in firewall, a single IP address, auditing and diagnostic tools, and central access control, according to Patricia Stedman, Incognito vice president of sales and marketing.

Pricing will be announced upon the product's release in December.

& LANshark: (614) 751-1111; Fastlane: (613) 727-5353; Incognito: (604) 688-4332.

NET RESULTS

Look to RMON for better switch management

As switching proliferates through networks to address bandwidth shortages, the lack of robust built-in management capabilities in switches has emerged as a significant concern.

Switch management is problematic in that each switch port represents a discrete LAN. If you wish to monitor a specific LAN in a simple switch, it becomes impossible because you must remove the device that you wish to monitor to gain access to its port. The good news is that help is on the way from Remote Monitoring (RMON) technology.

Skip MacAskill and Melinda Le Baron

Last week, Cisco Systems, Inc. became the latest campus LAN player to unveil its RMON plans when it announced it will work with Frontier Software to integrate RMON into Cisco's switch line. Companies such as Bay Networks, Inc., Cabletron Systems, Inc. and 3Com Corp. are already on the RMON bandwagon.

RMON products can reach out to devices across a switched net, get a reading on their status and feed information back to a central console.

But these products — which involve the continuous gathering of statistics — can do more harm than good if not installed correctly.

Typically, this involves additional hardware that makes sure the management application does not draw on resources that a switch would otherwise use to handle the exchange of traffic.

LANNET Inc. is one vendor that has come up with a sensible RMON implementation, taking advantage of its MultiNet switch's internal architecture to leverage its RMON implementation. LANNET's Switch Remote Monitoring (SMON) technology is one of the cleanest and most comprehensive Ethernet switch management offerings on the market today. It not only allows users to capture overall traffic patterns, but also provides visibility into virtual LANs.

These capabilities are made possible by LANNET's Cellenium architecture, which is based on a time-division multiplexing bus, in combination with a SMON module within the MultiNet switching hub. Since all traffic handled by the switch must cross this 1.28G bit/sec bus, MultiNet provides users with a centralized point for traffic monitoring and packet capture.

The SMON probe is both passive and transparent, in effect eavesdropping on all traffic that crosses the bus. It operates independently from the switching modules, allowing them to use full processing and memory systems for data forwarding.

As new management capabilities need to be added, LANNET can simply add more software to SMON. Other vendors using a distributed approach may have to update both hardware and software on every switching module, costing users both time and money.

There are no management standards for switching, so the SMON offering from LANNET is proprietary, except for its standard RMON pieces.

But it's a good example of how vendors can maximize use of a device's architecture to deliver needed functionality to users.

As switching technology evolves into a backbone technology of choice, management technology will have to keep pace. Users with switching requirements should look beyond performance and port count. If management is limited or missing, then they should look elsewhere.

MacAskill is a senior research analyst and Le Baron is a research director in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

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Xylan is among first to roll out token-ring switch

By Michael Csenger
Calabasas, Calif.

Xylan Corp. has joined the elite cadre of vendors actually delivering token-ring switches.

The company's Token Ring Switching Module (TSM) supports as many as six separate rings, switching traffic from one ring to another according to virtual LAN address assignments. The module fits in Xylan's five- and nine-slot OmniSwitch chassis, providing a total of 24 and 48 rings, respectively. (Each chassis has one slot reserved for a high-speed FDDI or Asynchronous Transfer Mode trunk.)

"Virtual rings" are a key feature of Xylan's design, letting users segment overloaded rings without having to go through the administrative hassle of assigning them new ring numbers.

Token-ring vs. Ethernet

In token-ring switching, unlike Ethernet switching, most end devices are not given a dedicated link. Token ring is more expensive than Ethernet, and it is an inherently more efficient protocol. So the goal in token-ring switching is to reduce the number of devices per ring and then switch rather than route between rings.

Also unique to Xylan's switch design is the ability to translate between token-ring and Ethernet media access control (MAC) addresses. This lets token-ring and Ethernet devices share the same servers.

"When you get into ATM LAN Emulation, for instance, one of its limitations is that a server must be either token ring or Ethernet," said Douglas Hill, Xylan's vice president of marketing. "But you want something like an E-mail server to be open to everyone on the net. Because we do MAC-layer translation, we can make your Ethernet traffic look like token ring, or vice versa, to work around ATM LAN Emulation on the backbone."

No big complaints

Xylan's early customers have found no major problems with the firm's token-ring implementation.

"I've ripped out the guts of my network and replaced it with one switch, and I expected a lot more trouble than I found," said Norman Tinowits, network administrator for Timberline Software in Beaverton, Ore. "I'm getting some abnormal ring purges, but no data corruption or downtime to worry about."

Tinowits replaced six CrossComm Corp. routers on a LAN backbone with an OmniSwitch equipped with two token-ring modules.

Timberline settled on Xylan's OmniSwitch because it cost about $30,000 less than CrossComm's recommended upgrade. "I didn't have to evaluate a lot of other options after that," Tinowits said. "We looked at Cabletron but didn't like what we found as much as Xylan's technology and price. They're a new company, so we recognized that there was some risk but decided to go for it."

The token-ring switching module is available now for $8,850.

©Xylan: (818) 880-3500.

Palindrome takes a step forward with NT backup

By Ben Heskett
Naperville, Ill.

Palindrome Corp. last week unveiled a new version of its LAN backup software, the first edition supporting Windows NT networks.

Backup Director 4.0 marks the Seagate Software Co. subsidiary's move beyond the market for Novell, Inc. NetWare backup management tools.

The product runs on a Windows NT server and can be configured from an NT- or a Windows-based management console.

The 32-bit multithreaded application can be used to back up data from NT or NetWare servers, as well as from clients running Windows and Windows NT, DOS, OS/2 and Unix.

Backup Director 4.0 includes a module that keeps track of backup operations and notifies network managers about problems via electronic mail or Simple Network Management Protocol alerts.

A related function load-balances backup jobs among devices, and detects and corrects for corruptions and other errors during the backup process.

Backup Director 4.0 can also read user information from the Windows NT Registry and NetWare Directory Services, which allows end users to back up or restore their own files, or to identify by user name files that should be restored.

Company officials said the product could be used to transfer files between NetWare and NT servers by backing them up from one server and restoring them on the other.

Dennis Casey, an analyst with Strategic Research Corp. in Santa Barbara, Calif., said Palindrome has offered the first "data management class" backup product for the Windows NT platform.

Several Palindrome competitors, including market leader Cheyenne Software, Inc., have already shipped backup products for NT, but those offerings lack many of the best features found in the companies' NetWare versions, Casey said.

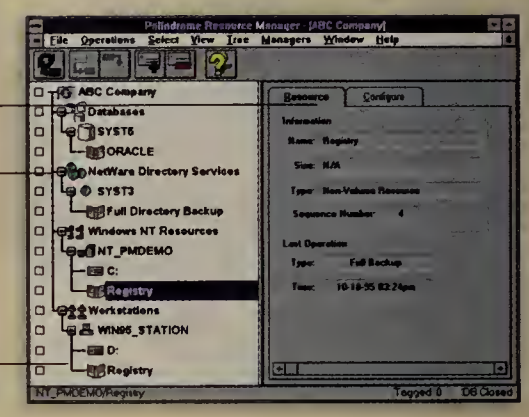
"[Palindrome] has maybe taken a little longer to get there, but they've put out a more robust product," he said. Casey noted that Version 4.0's media management features put it ahead of the competition.

Palindrome has also bundled with the product a backup storage hub from Hitachi Data Systems to sell as a drop-in dedicated backup traffic management device.

Version 4.0, available now, is priced at $995 for the single-server version and at $1,595 for a multiserver version.

©Palindrome: (800) 288-4912.

BACKUP DIRECTOR 4.0



Intel

Continued from page 27

The opportunity could be great since neither Novell nor Microsoft has paid much attention to delivering tools for managing nets running the other's LAN software.

However, the fact that Intel made its NT management announcement right after Novell issued a new version of Managewise without any Intel-related upgrades raises questions about Intel's commitment to Managewise.

"If I was Novell, I might be a little concerned. This is, after all, the second time Intel has immediately followed a Managewise announcement with one of its own," said Waverly Deutsch, an analyst with Forrester Research, Inc. in Cambridge, Mass.

Intel officials said the company is just following the market.

"We've thought about [our strategy] a lot and know that both Microsoft and Novell are very interested in their own agendas and are pursuing them very aggressively. Obviously, they would want us to try to limit our involvement with the other party," said Terry Dixon, Intel's director of marketing for net management products. "But for the customers' sake and our strategic objectives, we really need to enable everybody and provide technology to everybody."

Managewise 2.0, meanwhile, remains "down-rev" on the Intel side by including features of LANDesk Manager 1.51, not the latest 2.0 edition.

A report from the META Group, Inc. consultancy that followed the announcement of Managewise 2.0 criticized the product for not including the software distribution and metering from the current version of LANDesk Manager. The report also faulted Managewise 2.0 for not supporting the registry in Windows 95 and Windows NT, or the Desktop Management Task Force's Desktop Management Interface.

META Group's conclusion was that Managewise is a viable solution for NetWare environments, but users looking for integrated asset management — which Intel is planning to provide — should look elsewhere.

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MORE ON-LINE
See how an Australian university is building its own LAN management suite on Network World Fusion. Link to http://www.nwfusion.com. From the main menu, select News+ then Local Networks.
NetworkWorld Fusion

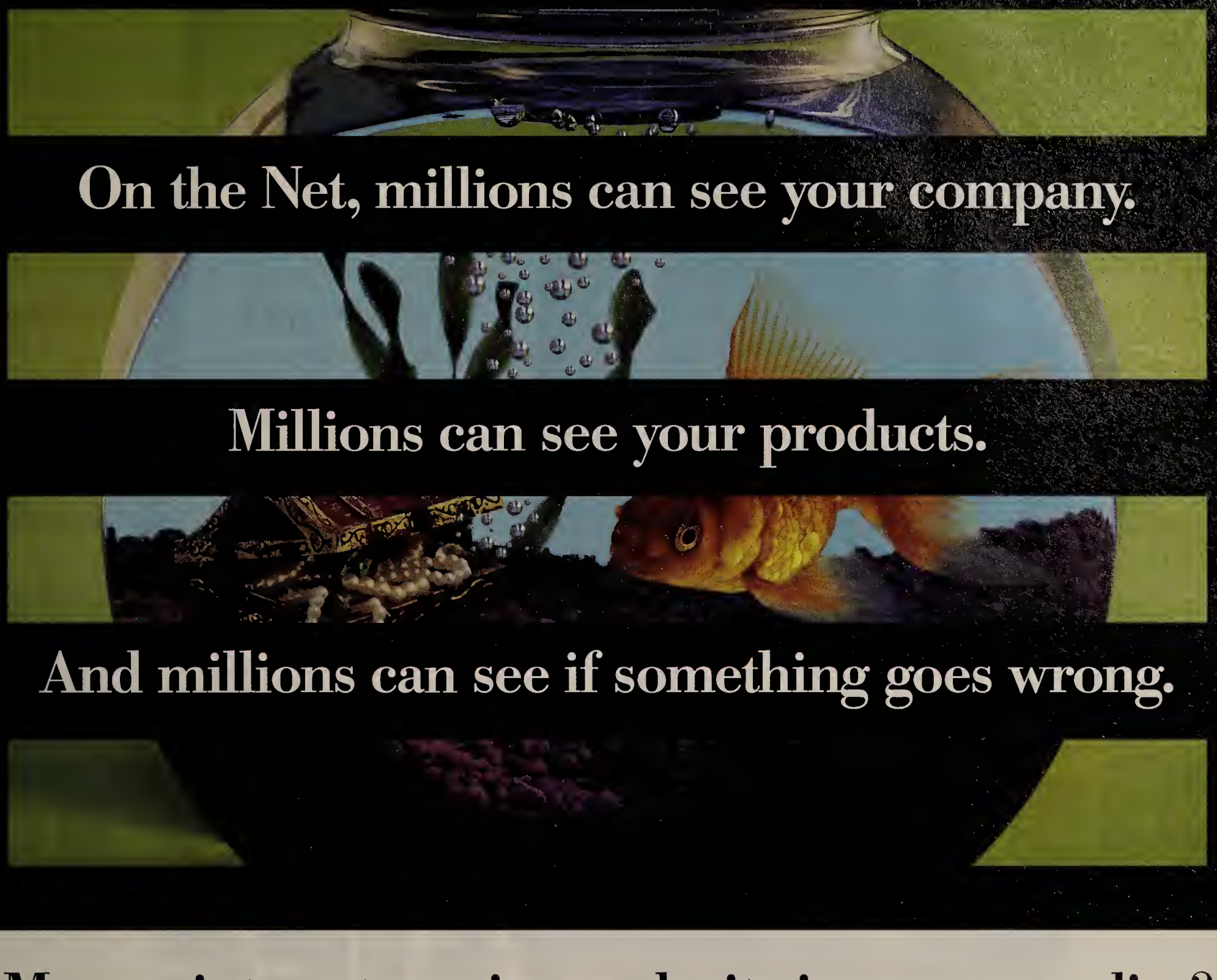
BusinessBriefs

The Salutation Consortium last week released an open interface specification that lets office copiers, printers, fax machines, desktop applications and network services announce themselves to other devices across a LAN. The Salutation Specification, developed by the cross-industry consortium, is designed to let any device either initiate or respond to a query about data formats and data characteristics.

The specification is available via the World-Wide Web at http://www.salutation.org/salute/.

Digital Equipment Corp. in Maynard, Mass., last week announced the appointment of Avi Fogel as vice president of global marketing for its Network Products Business. Fogel will be responsible for product marketing, product management and field marketing. He comes to Digital after founding in 1990 the North American subsidiary of LANNET Data Communications, Ltd., where he was president and chief executive officer until September 1994. He then built the parent corporation's global marketing and business development organization, and served as the executive vice president until the company's acquisition by Madge Networks, Inc. this summer.

Fogel



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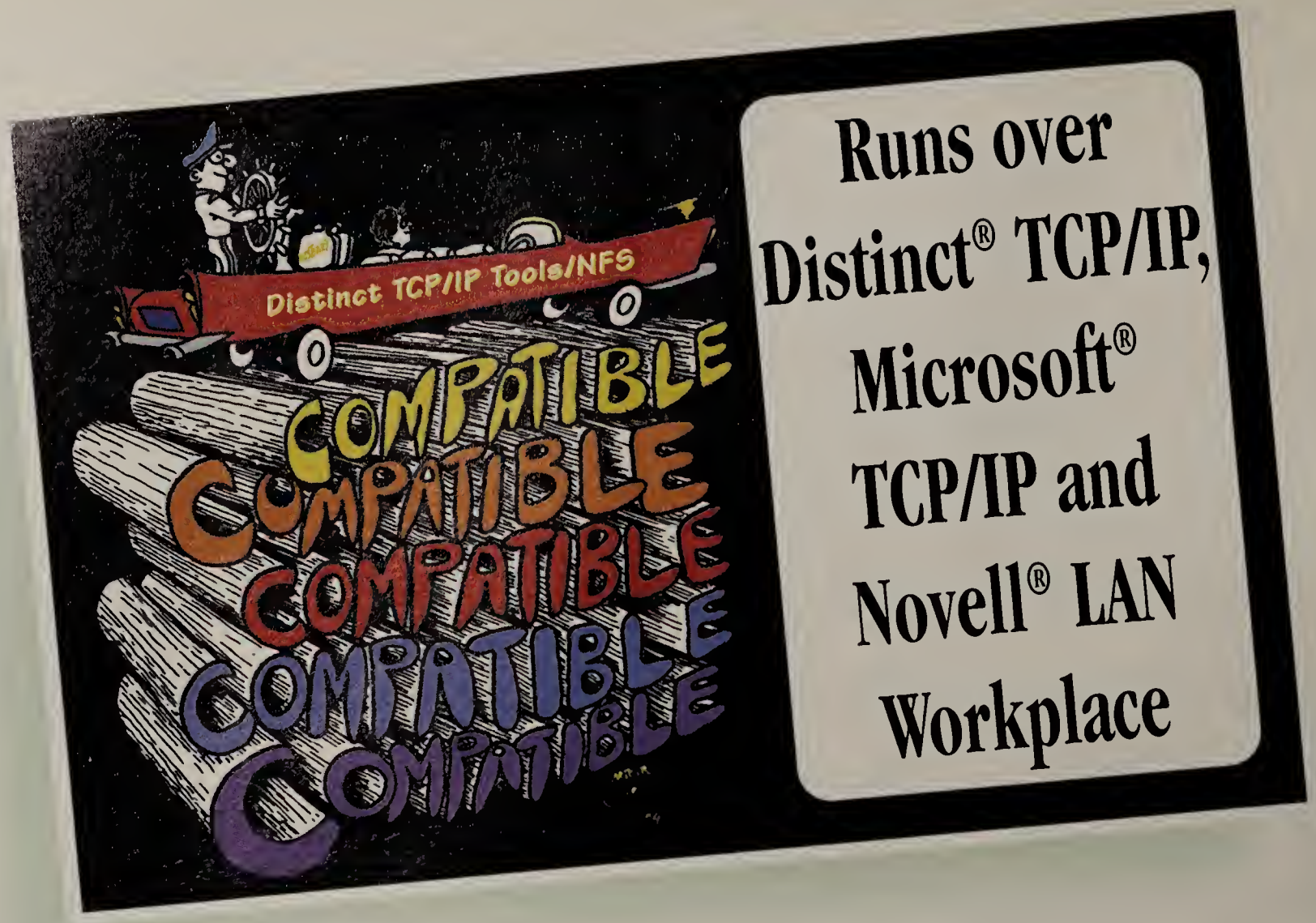

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Bay Networks stocks up on stackable hubs

By Jim Duffy
Santa Clara, Calif.

Bay Networks, Inc. has unveiled a stackable 10Base-T hub that, together with some repackaged switches and routers, will be part of a new low-end offering.

Called BayStack, the low-end package includes the new BayStack 10Base-T hub and stackable versions of Bay's existing Ethernet workgroup switch, 100Base-T hub, Access Node and Access Node Hub routers. Bay also rolled out new Optivity management software for monitoring and controlling BayStack devices.

Analysts said BayStack, targeted at workgroups and remote office sites, is a response to stackable offerings from rivals 3Com Corp. and Hewlett-Packard Co.

"In Bay's channels, this is overdue. It's a good business move for them," said Charlie Robbins, vice president of communications research at Aberdeen Group, Inc. in Boston.

The new BayStack 10Base-T hub supports 12 to 24 RS-45 repeater ports and dual media adapter slots. As many as 10 BayStack 10Base-T hubs can be stacked for a total of 260 ports, which can be segmented across three LANs.

The BayStack 10Base-T also sports an optional network management module for Simple Network Management Protocol-based monitoring of all 10 hubs in the stack and the three segments configurable with the stack. The hubs also feature a Management Extension port, which enables the management module to monitor hubs up to 100 meters away.

Still, users are disappointed that BayStack does not actually connect device backplanes. "It'd be nice to eliminate external connections," said Zeke Crater, team leader of net support for Queens Medical Center in Honolulu. "And I would have liked to have seen an integrated package that could share a high-speed backplane."

The new Optivity software packages, meanwhile, are called EZ Internetwork and EZ LAN. Both run on Windows workstations. EZ Internetwork provides discovery plus fault, performance and configuration management for BayStack routers. EZ LAN provides discovery, fault, configuration and installation, and agent update management, for BayStack hubs.

©Bay: (408) 988-2400.

BAY PRODUCTS

Product	Price
BayStack 10Base-T hub	$899-$1,549
EZ Internetwork	$99
EZ LAN	$99

*All products are available now.

3Com

Continued from page 27

"We were going to buy some RMON sniffers anyway," he said. "We were constantly having to send a technician to see what sort of traffic goes on between two pieces of equipment, to trace problems or to help with the installation of a new box. Now we don't have to send a person out to do that; this application does a nice job of presenting all the information you need."

The basic default screen on a Transcend console has enough data to help Green's team determine the likely source of a net problem. For a more in-depth study of complicated problems, Green said he would most likely use a dedicated RMON sniffer.

Analysts said RMON is a sensible start, but 3Com still has a way to go toward seamlessly melding all of its product lines. "RMON is the best way for them to aggregate information from diverse elements in a network," said Glenn Gabriel Ben-Yosef, president of the consultancy Clear Thinking Research in Boston. "And it's the right technology for them to integrate into future acquisitions as well."

Available now for Unix and in September for Windows, the new Transcend applications cost $9,495 and $3,495, respectively. RMON agents are included in many products now and will be rolled into all others over the next year as standard product features. RMON2 support will be added early next year.

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Tough choices

Here are some quick and simple rules to follow when deciding where to put Ethernet, fast Ethernet, FDDI and ATM technologies in your network.

Net environment	Technology choice
Most stations are contributing 10M bit/sec or less of traffic, and the user is not experiencing media congestion.	Shared Ethernet
Most stations are contributing 10M bit/sec or less of traffic, and the user is experiencing media congestion.	Switched Ethernet
A small number of stations are contributing more than 10M bit/sec of traffic.	Switched Ethernet for most clients and switched fast Ethernet for the few servers or stations that need to exceed 10M bit/sec
A large number of stations are each expected to contribute more than 10M bit/sec of traffic during peak periods, where the total amount of traffic is less than 100M bit/sec.	FDDI
A group of elite workers – end users who have a high degree of computer literacy and are likely to be involved in video applications – and a network adapter card change-out is planned.	25M bit/sec ATM

GRAPHIC BY TERRI MITCHELL

SOURCE: CIMI, VORHEES, N.J.

Negotiating the fast LAN technology maze

Where do switched Ethernet, fast Ethernet, FDDI and ATM fit in your net environment?

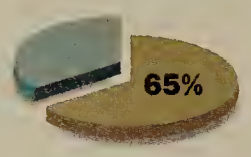
By Jodi Cohen

Deciding whether to go with a shared or switched fast LAN technology once you start to max out your shared Ethernet or token-ring LAN is a tough call.

Users and analysts involved in implementing high-speed LANs have learned the benefits of each. While shared technologies, such as fast Ethernet, 100VG-AnyLAN and FDDI, offer 10 times the performance of 10Base-T, switching technologies, such as switched Ethernet and Asynchronous Transfer Mode, provide network devices with prized dedicated bandwidth.

However, there are trade-offs to each, and knowing which fast LAN technology to choose is critical for solving network performance problems and avoiding costly purchasing mistakes.

About 65% of all desktop devices will never justify ATM connections, according to CIMI, a consultancy in Voorhees, N.J.



Switched vs. fast Ethernet

Ethernet sites typically run into either of two general types of performance problems: They run out of collective or individual LAN capacity. The first problem — media congestion — crops up simply because there are too many stations on the LAN generating too much traffic. The second problem usually arises at an individual server that is supporting multiple users whose interaction with the server starts pushing the limits of the 10M bit/sec Ethernet link.

Companies finding they have a media congestion problem with stations that do not need to run more quickly than 10M bit/sec are better off going with switched Ethernet, analysts said. By installing an Ethernet switch, users can provide stations with dedicated 10M bit/sec bandwidth without changing network adapter cards.

ATM is also a good desktop technology for certain situations, according to analysts. Companies that have several key power users — those running multimedia applications and the like — and that are planning a change from network adapter cards should evaluate 25M bit/sec ATM (ATM25). An Ethernet or token-ring switch that supports a few ATM25 ports can be a good choice here.

But as switching comes to the desktop, a move to switched fast Ethernet at the server might need to follow, according to analysts. Switched fast Ethernet, which provides a dedicated 100M bit/sec pipe, will increase net performance over Ethernet by a factor of 10 while eliminating network collisions.

However, some vendors and users contend that shared fast Ethernet is appropriate for server and backbone connections. Jerry Zickrick, director of internal information systems at ProBusiness, Inc. in Pleasanton, Calif., is employing Grand Junction, Inc. gear to provide dedicated 10M bit/sec Ethernet links to the desktop that feed into a shared 100M bit/sec Ethernet backbone.

"The fast Ethernet backbone has improved the reaction time of our network, and it has been able to maintain that even as our user community grows," he said.

Zickrick ruled out FDDI as a backbone technology because it is still too expensive. Network interface cards currently range from $500 to $2,000, and an FDDI hub can cost anywhere from $450 to $2,000 per port.

"The fast Ethernet backbone has improved the reaction time of our network, and it has been able to maintain that even as our user community grows," said Jerry Zickrick of ProBusiness.

He also dismissed 100VG-AnyLAN as a viable option because it would not work with his current two pairs of Category 5 unshielded twisted-pair cabling. Unlike fast Ethernet, which runs on two pairs of Category 5 wire, 100VG-AnyLAN requires four pairs of cable.

Analysts said 100VG-AnyLAN has its benefits — including a shared token-passing architecture that eliminates packet collisions, and the ability to run on four pairs of Category 3, 4 or 5 wire — but it lacks widespread vendor support.

Don't forget to share

While switching seems to be the industry's current darling, fast Ethernet vendors pointed out that it is easier to manage a shared LAN than a switched one. In a shared environment, a net manager can attach a probe — such as Network General Corp.'s Sniffer — to any hub port and capture all of the network traffic.

This is not possible in a switched environment because there is no central place on the network to tap in and collect a sampling of all the data.

Despite its management shortcomings, switching wins hands down over fast Ethernet, according to many observers.

"If you have a switched 10M bit/sec Ethernet environment, you've eliminated a collision domain," said Tom Bain, a research analyst at META Group, Inc., a consultancy in Reston, Va. "No matter what I do with shared fast Ethernet, I'll still have collisions."

"I don't think shared fast Ethernet is worth squat. Very rarely would you find a situation where shared 100M bit/sec was sensible. But if a user really wants it, FDDI is better technology than shared 100M bit/sec Ethernet."

Thomas Nolle

Another fast Ethernet limitation is that there are no routing interfaces available yet for 100Base-T, said Skip MacAskill, a senior research analyst at Gartner Group, Inc. in Burlington, Mass. That means traffic cannot be routed between fast Ethernet LANs, he said.

To fully implement fast Ethernet, users must invest in new adapters, hubs, switches and, in some cases, wiring. In addition, MacAskill said there has been a noticeable lack of interoperability and compatibility testing among vendors' fast Ethernet gear.

Also, fast Ethernet is hampered by distance limitations: Its copper interfaces only support distances of 100 meters between an endstation and a repeater, and 10 meters between repeaters. This prevents fast Ethernet from being a good backbone technology choice, analysts said.

Thomas Nolle, president of CIMI Corp. in Voorhees, N.J., said he does not see an elegant place in the network to put shared fast Ethernet. He prefers FDDI for a shared 100M bit/sec technology because of its deterministic, token-passing quality.

"If you need to go to 100M bit/sec, you want to be able to utilize as much of it as possible," he said. "Shared fast Ethernet is effectively about 58M bit/sec when you consider collisions and overhead, whereas FDDI is effectively 95% utilization — so you're better off with FDDI."

In addition to having very little overhead, FDDI is a mature and widely supported backbone technology. However, FDDI is quite expensive and only supports fiber and Category 5 cable.

Adding ATM

Many industry observers are predicting that ATM switching will become prevalent as a high-speed backbone technology in late 1996 or early 1997.

Some of ATM's benefits include its cell-based switching scheme that protects traffic from the latency problems it faces over shared media. Analysts also said ATM scales easily and will allow for seamless LAN and WAN integration.

Then again, ATM standards are not yet completed, equipment needs to be swapped out to upgrade from legacy LANs, and most ATM products on the market are quite expensive.

Zickrick even said he plans to migrate from his shared fast Ethernet backbone to ATM over the next few years.

"I've got my fingers crossed that ATM becomes a viable backbone alternative before we start maxing out our fast Ethernet backbone and experiencing any kind of delays," he said. ■

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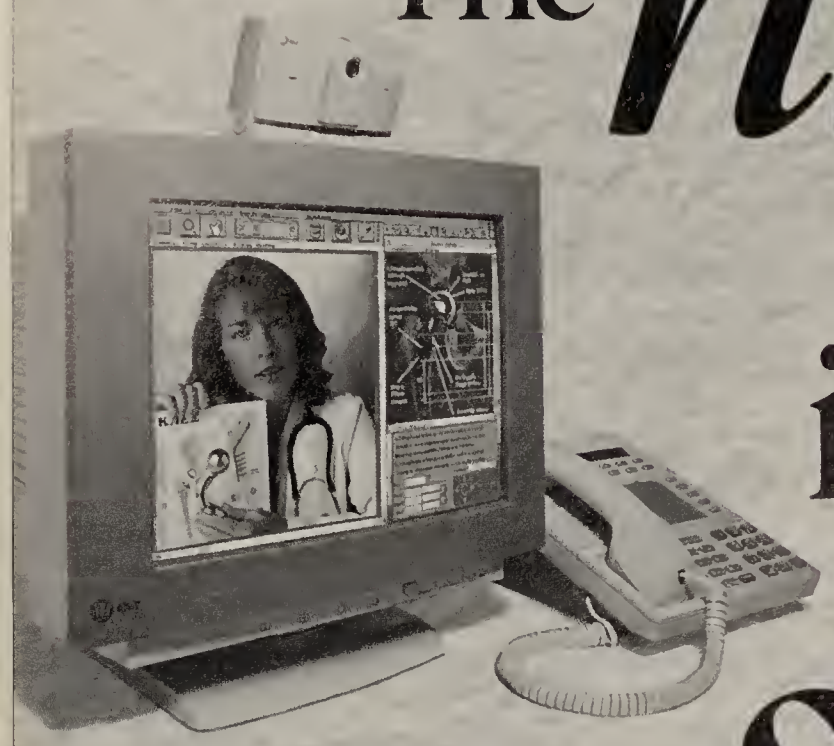

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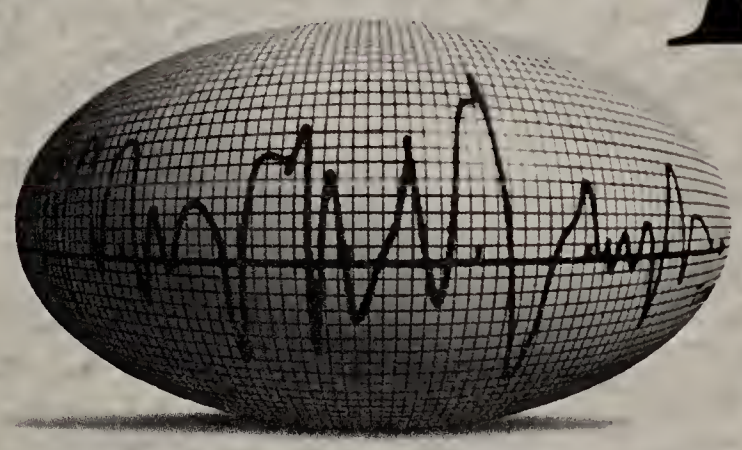

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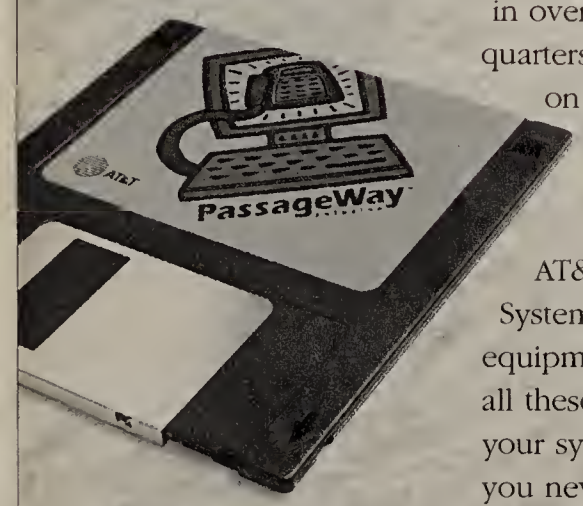

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Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

■ **Collabra Software, Inc.** *of Menlo Park, Calif., has begun shipping Version 2.1 of Collabra Share, a new version of its group conferencing software with links to the* **World-Wide Web** *through Netscape Communications Corp.'s Navigator. Netscape purchased Collabra over the summer.*

Collabra Share 2.1 automatically highlights incoming Web information, creating a hypertext link as the information is posted in Collabra Share. In addition, a new toolbar button allows users to launch Navigator from within Collabra Share.

Available this month for Windows, Collabra Share 2.1 costs $69.95 per user for a 100-user license.

Collabra: (800) 474-7427.

■ **Actuate Software Corp.** *in San Mateo, Calif., is now shipping its Actuate client/server reporting system. The software lets developers build business reports using* **reusable objects,** *which are stored and manipulated on a server via a graphical user interface-based client.*

The software runs on Windows clients as well as on Unix and Windows servers. It has native interfaces to Sybase, Inc.'s SQL Server, Oracle Corp.'s Oracle 7, Informix Software, Inc.'s OnLine and Microsoft Corp.'s SQL Server.

Actuate system pricing

Developer Workbench	$1,999
End User Workbench	$599
End User Desktop	$199
Administrator Desktop	$599
Report Server	$1,500+

Actuate: (415) 638-2000.

■ **Persistence Software, Inc.** *in San Mateo, Calif., this week will announce Persistence 3.0, a tool that lets developers use C++ to build* **object-based applications** *that work with relational database systems. The new version now supports Windows and has an enhanced transaction manager for improved performance. Available this month, Version 3.0 also supports several flavors of Unix. An average configuration costs $30,000.*

Persistence: (415) 341-7733.

SQL Server 11 plugs key holes for Sybase

By Barb Cole
Emeryville, Calif.

Sybase, Inc. last week announced SQL Server 11, a new generation of its database that is substantially more powerful than earlier versions but still falls short on parallel processing compared to rival offerings.

With SQL Server 11, Sybase has improved the performance of its flagship database as much as threefold and greatly improved support for multiprocessor computers.

"With [SQL Server] 11, the performance issue will be put to bed and the scalability is now sufficient to support 16-processor computers," said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

The ability to move databases to multiprocessor systems is key for customers who are looking to deploy the software across the enterprise in support of more users and data.

Databases can run faster on multiprocessor machines because work is divided among multiple processors working in parallel. The previous version of SQL Server maxed out at around four processors, the company has admitted.

SQL Server 11 achieves its impressive performance gains through more efficient use of memory and unique caching capabilities, said Wayne Kernochan, an analyst at Aberdeen Group, Inc., a market research firm in Boston.

In terms of its overall support for parallel processing, Kernochan said, "Sybase is getting there, but it still hasn't really

See **Sybase,** *page 38*

RealityCheck

Product
System 11

Company
Sybase

The benefits
- ▲ Includes improved support for parallel processing systems.
- ▲ Performs 2 to 3 times better than the previous version.
- ▲ Features better scalability and stability than earlier versions.

The drawbacks
- ▼ Lacks low-level locking needed for certain client/server applications.
- ▼ Cannot process queries in parallel.

The user view

"System 11 exceeded our expectations. It scales to eight processors with linear performance gains."

Ken Szczesny, vice president of advanced development, AC Nielsen Marketing Research Corp., Schaumburg, Ill.

Novell jazzes up Tuxedo to manage bigger nets

By John Cox
Florham Park, N.J.

The newest release of Novell, Inc.'s Tuxedo transaction processing (TP) system adds big changes in two key areas: managing large-scale distributed applications and triggering application activity based on live events.

The changes in Tuxedo System 6.1 announced last week are part of Novell's ongoing effort to recast the Unix TP monitor as an essential technology for supporting enterprise applications, according to Joe Menard, a vice president and general manager of Novell's distributed services division here.

"Tuxedo System 6 is a complete solution for line-of-business distributed applications."
Joe Menard

Users say TP monitors — which can be employed to coordinate application components over a network, ensure reliable operations, protect data integrity and off-load key processing to a middle tier of servers — are as valuable for networked applications as for traditional on-line TP (OLTP) systems.

"To deploy large-scale, business-critical applications with lots of on-line users, you need a traffic cop — something that can oversee the operation of the application as a whole," said Paul Tocatlinan, technology director of distributed solutions at Tangent International Computer Consultants, a New York-based company that specializes in building large OLTP systems, and a Tuxedo 6.1 beta site. "I would say most of our customers are using Tuxedo for message-passing [among application components], as opposed to transaction control."

The new release, available now, includes what Novell calls the Application Management System (AMS), which replaces a terminal-oriented, command-line interface. AMS consists of a Management Information Base of data on clients, servers and hosted applications, a set of APIs and a graphical interface for Tuxedo administrators. Via the API, developers can build their own management tools and connect them with third-party tools.

In the future, Novell will release Simple Network Management Protocol agents that will link Tuxedo with popular net management consoles.

"They were way behind in the management area [compared to rival products]," said Jim Johnson, chairman of Standish Group International, Inc., a Dennis, Mass., OLTP consulting company. "[AMS] has made some giant leaps forward."

Also new is the Event Broker, which introduces yet another way for Tuxedo application components to communicate with one other. This asynchronous

See **Tuxedo,** *page 38*

Conferencing offerings aim for the desktop

By John Cox

A slew of new products are making desktop video and data conferencing more practical.

Among the new offerings is a desktop videoconferencing system that supports much faster video frame rates over Basic Rate Interface ISDN lines, while others aim at exploiting the International Telecommunication Union T.120 standard for sharing data, image and audio traffic over a network.

Companies with products include:

■ Dallas-based Vcon, Inc., which has unveiled the Armada Cruiser 100 System, a desktop videoconferencing system based on a patented video postprocessing technique to boost video transfer over ISDN from the typical 15 frame/sec to about 24 frame/sec. At that rate, video images move smoothly, even if low data rates are used for the actual transmission.

Armada includes a coder/decoder board, a camera, an audio handset and PC software at a list price of $1,595. The system works over WAN links from 64K bit/sec up to 384K bit/sec with any H.320-compatible conferencing product. It will support T.120 in the future.

■ Westminister, Colo.-based ConferTech International, Inc., which has begun demonstrating the beta release of Prelude, a T.120 multipoint document conferencing bridge.

The product supports sessions over any combination of analog modem, TCP/IP or Novell, Inc. IPX networks. Prelude can be used to manage conferences on a corporation's internal network or to connect with external conferencing systems.

See **Conferencing,** *page 38*

French vendor targets U.S. enterprise apps mart

By John Cox
Reston, Va.

A French software vendor last week relocated to the U.S. and will soon introduce a tool set for building large-scale distributed applications.

Although unknown in the U.S., Nat Systems, Inc. expects to sell some $30 million worth of its NatStar/Adaptable Development Environment (ADE) product this year.

That will pit the company against the likes of Dynasty Technologies, Inc. and Forte Software, Inc., which also sell tools for building large, complex business applications that span from desktop PCs to legacy mainframes.

Nat Systems expects to sell some $30 million worth of its NatStar/Adaptable Development Environment product this year.

Like rival products, NatStar/ADE includes a development repository, graphical development tools, code generators, communications middleware and transaction services. It also features tools for building data, object and process models, which are stored in the repository and used to generate the final application.

NatStar/ADE-built applications are created as a set of services that are deployed on multiple computers and invoked at run-time as needed.

By contrast, some rival tools require developers to decide beforehand where the various parts of the application will run. Configuration changes to computer systems running these applications can require regenerating and redistributing the application, said Olivier Dellenbach, founder, chairman and chief technology officer for Nat Systems.

As part of its U.S. move, the company has hired John Burton as president and chief operating officer. Burton previously held the same titles at LEGENT Corp. since 1989.

✆Nat Systems: (703) 620-9200.

Tuxedo

Continued from page 37

technique lets Tuxedo administrators define actions or events to which users or applications can subscribe.

The result is a higher level of interaction among applications. For example, changes in a stock's price could trigger an alert that is sent to a trader's workstation. The arrival of the alert could, in turn, prompt a database lookup for the stock's price history.

"[Event Broker] enables the concept of business events," said Mitch Kramer, consulting editor for Patricia Seybold Group, Inc., a technology market research company in Boston. "This lets you integrate applications and automate business processes, which is really significant."

Kramer likened Event Broker's potential to that of workflow products, though there are important differences. Because Event Broker is part of Tuxedo, its capabilities can be embedded in existing applications. And Event Broker can coordinate this application interoperability across an enterprise network, whereas many workflow products are focused on workgroups or departments.

The third main change in Tuxedo 6.1 is the introduction of Access Control Lists, which let administrators restrict users to access only specific Tuxedo services. In the past, Tuxedo offered only an authentication mechanism; once accepted, users could access any part of the application.

Novell also introduced a companion product, NetWare TransactionLink, that runs a subset of Tuxedo services on a NetWare LAN server. The software, which is fully integrated with Novell's NetWare Directory Services, lets NetWare clients access Tuxedo servers without additional networking software.

"Most of our clients are using Tuxedo 4.2," Tocatlinan said. "Version 5.0 had some problems. But 6.1 is rock solid."

The run-time version starts at $395 per user, while the developer version starts at $2,395 per developer. NetWare TransactionLink is available now for $1,295.

✆Novell: (800) 453-1267.

Pack to help users extend imaging systems

By Jon Skillings and Barb Cole
Colorado Springs

Optika Imaging Systems, Inc. will ship by year-end a software suite to let users expand an imaging system from a workgroup to the enterprise without totally redesigning it.

The software combines imaging, workflow and computer output to laser disk technology, and is designed for quick installation, said Dave Mansen, Optika's vice president of marketing.

The two parts of the suite — Optika/WG for workgroups and Optika/EP for enterprises — are based on the same core technology and include a Windows client component and server components that run on Windows NT.

However, the products' flexibility is somewhat limited, according to one analyst.

"It doesn't [let you] go from an ad hoc [imaging system] to a production system," said Paula Boyle, an analyst at BIS Strategic Decisions in Norwell, Mass. It is strictly a production system dealing with structured processes, she said.

Boyle described the software's WorkBook feature, which lets end users separate some data from the imaging system for dissemination via electronic mail or CD-ROM, as innovative.

Pricing was not available.

Optika: (719) 548-9800.

Skillings is an editor and correspondent with the IDG News Service in Boston.

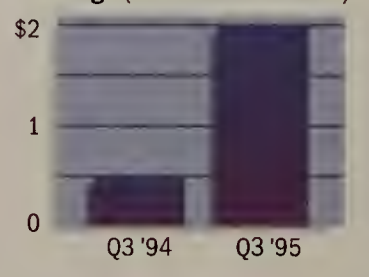
BusinessBriefs

Vmark Software, Inc. in Westborough, Mass., last week reported falling revenue and a loss of more than $1 million in the third quarter. The loss was attributed partly to costs related to the database company's merger with tools vendor Easel Corp. in June.

Client/server application development tool maker **Blyth Software, Inc.** of Foster City, Calif., continues to lose money but at a slower rate. The company reported $3.1 million in revenue for its second fiscal quarter, down about 10% from the comparable period last year. Blyth has lost about $4 million over the last two quarters, but at least that is down from about $5.6 million lost during the first six months of its past fiscal year.

Business Objects, Inc. in Cupertino, Calif., continues its fast-paced growth. Last week, the maker of decision-support front-end tools reported third-quarter revenues of $15.3 million, more than double the revenues for the same period last year. Earnings quadrupled from $500,000 in the third quarter last year to $2 million in the third quarter this year.

Earnings (in millions of dollars)



Conferencing

Continued from page 37

The product is expected to cost $20,000 for a minimum eight-port configuration. A single bridge can have as many as 32 ports, and three bridges can be linked for 96 ports. No shipping date was disclosed.

■ Creative Technology, Ltd., based in Singapore, and Lexington, Ky.-based DataBeam Corp., which announced a joint licensing and development deal to create an application development tool kit for T.120 nets. The tool kit will let firms build programs for sharing Windows-based applications in real time across LAN or WAN links via T.120.

Among other products, Creative sells ShareVision, a desktop videoconferencing product that also lets users share desktop PC applications. DataBeam sells the Collaborative Computing Toolkit Series to build T.120 application-sharing solutions. No information was released on pricing or availability.

✆Creative: (408) 428-6600; ConferTech: (303) 633-3000; DataBeam: (606) 245-3500; Vcon: (214) 774-3892.

Network World Fusion

To tap into a virtual database on databases, visit Network World Fusion. Resources include:

- **White papers and videos about System 11**
- **A searchable database of postings to the Sybase mailing list**
- **Listings of the enhancements users most want from Sybase**

To access: Link to http://www.nwfusion.com. From the main menu, select News+ then Client/Server Applications.

Sybase

Continued from page 37

driven parallelism down [into the core of its database]."

Users are generally pleased with the much-anticipated database upgrade.

"Sybase has done a good job with this release," said Ken Szczesny, vice president of advanced development at AC Neilsen Marketing Research Corp. in Schaumburg, Ill.

Szczesny has been able to load up his 150G-byte database 50% faster now that he has upgraded to SQL Server 11.

And unlike SQL Server 10, which drove users away because of bugs, SQL Server 11 is the product of rigorous internal and beta testing.

"I expect we'll move [to SQL Server 11] right away for the performance improvements," said Joel Martin, manager of information services at Bose Corp., a Marlborough, Mass.-based supplier of audio components that runs a data warehouse based on SQL Server.

"Sybase has spent a lot of time and money to ensure that this release is stable," he said.

Other offerings

While Sybase's leadership role in the client/server database arena has been severely diminished, analysts say they have high hopes for some of its offerings, which were also highlighted at the announcement last week.

For example, SQL Anywhere, a low-end database aimed at mobile workers, will soon enable users to replicate data to the enterprise database from the road.

Oracle Corp.'s low-end database has similar capabilities, but it requires a lot more computer horsepower, Kernochan said.

SQL Server 11 will ship by the end of the year on Unix alternatives from Digital Equipment Corp., Hewlett-Packard Co., IBM and SunSoft, Inc., as well as on Microsoft Corp.'s Windows NT.

Pricing will range from $995 to $133,900.

✆Sybase: (510) 922-3500.

SHARED LOGIC

Software AG is getting serious about Microsoft's OLE

And the winner is . . . Software AG.

Microsoft Corp. recently announced that the Darmstadt, Germany, company is its exclusive partner to develop OLE capabilities on Unix, AS/400, VMS and mainframe operating systems (*NW*, Oct. 16, page 12).

You may know Software AG for its flagship Adabas database and Natural application development tool. These were originally mainframe-based products that Software AG now provides on all PC and other platforms. According to Thomas Zellman, a Software AG product marketing manager, it was this experience with software portability that convinced Microsoft to go with the German company.

The goal of this venture differs from that of related projects to explore the best ways of porting Windows to Unix and other platforms.

Software AG is not building a tool to run Windows applications on other platforms, though. Rather, the company is applying the OLE standard to enable program-to-program communication on non-Microsoft platforms.

For those of you familiar with message-passing protocols, you may find this news underwhelming. After all, Unix already offers several rich and well-tested methods for interprogram communication, including message-oriented middleware. How can OLE compete?

Marc Myers

The answer is in a first cut at a networked OLE. Microsoft has indicated that it will release a specification for Network OLE this month. Such software would allow programs to communicate across machines using OLE.

But this is only a specification. Software AG plans to forge ahead using its Entire middleware to allow OLE communication across machines.

Software AG is betting on users' tendency to regard Unix as a server-specific operating system. Many firms have placed Windows-based PCs on the desktop, while mission-critical Unix servers continue to provide database and application services. This solution satisfies users that want the latest in desktop software support, as well as administrators who depend on the robustness of Unix and its associated system management utilities.

As more firms move to mixed Windows/Unix networks, and as more Windows applications become OLE-enabled, the lack of a true OLE server will become more apparent. Software AG's Unix version of OLE, due in the first quarter of 1997, will allow developers to create Unix server software that can respond to OLE requests from Windows-based clients.

This solution will provide a streamlined integration of Unix and Windows. For example, you will be able to run your usual Windows applications on the PC. Then when you want to, say, create a link to the corporate database to populate a spreadsheet, you will be able to use OLE to create the connection.

The question remains whether anyone will use OLE in mixed environments, or if this is another smokescreen from Microsoft to draw attention away from the company's recent rift with the Object Management Group. Either way, Software AG will provide a top-notch product needed for building heterogeneous client/server systems.

Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726. Myers' column alternates in this space with that of META Group's Mike Rothman.

TCP/IP
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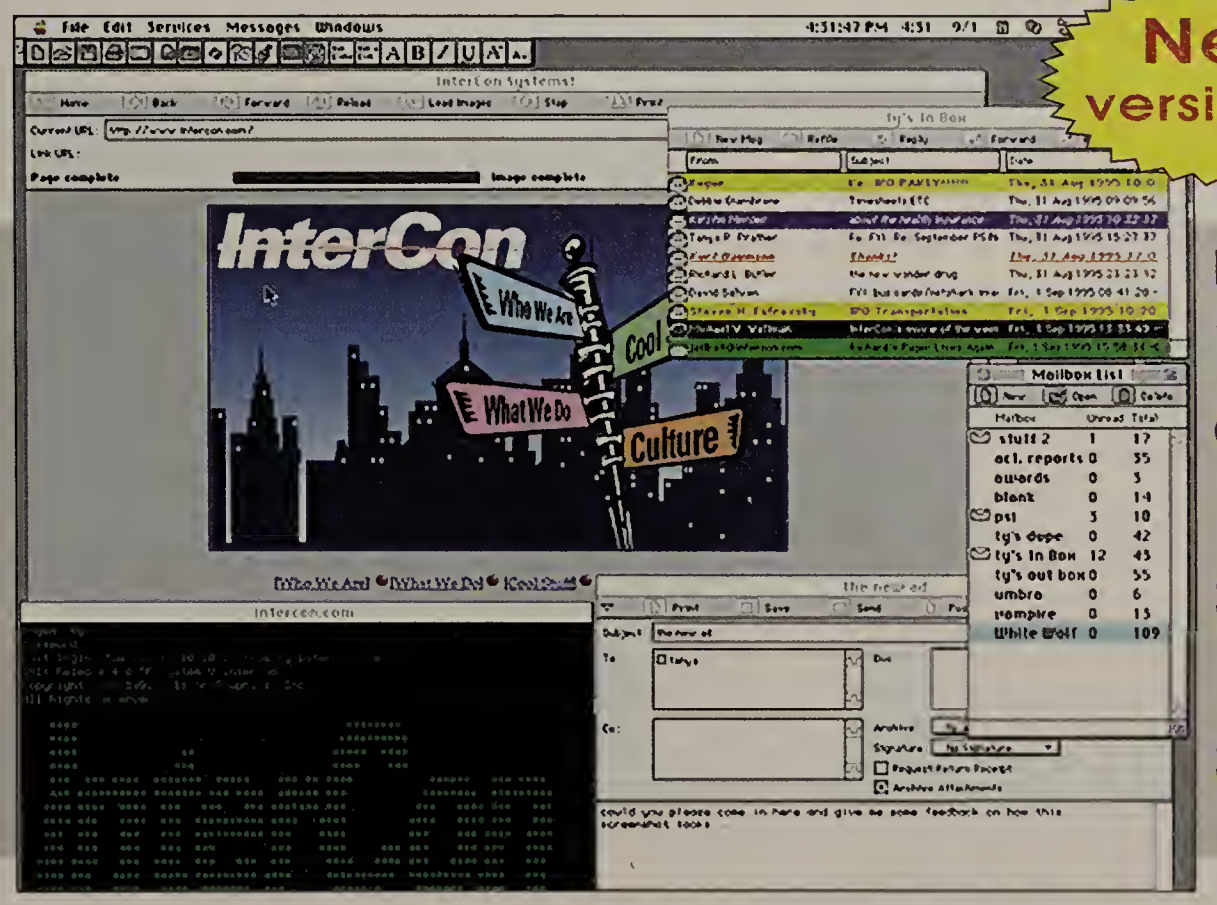

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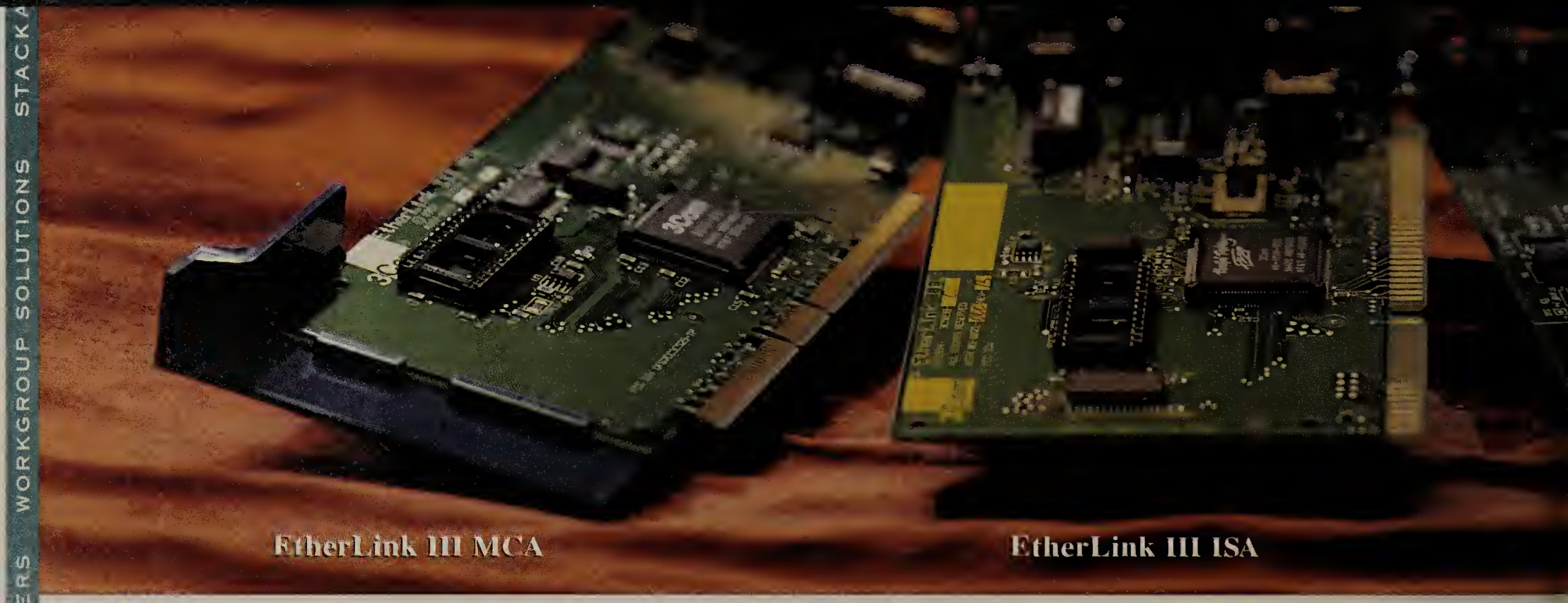

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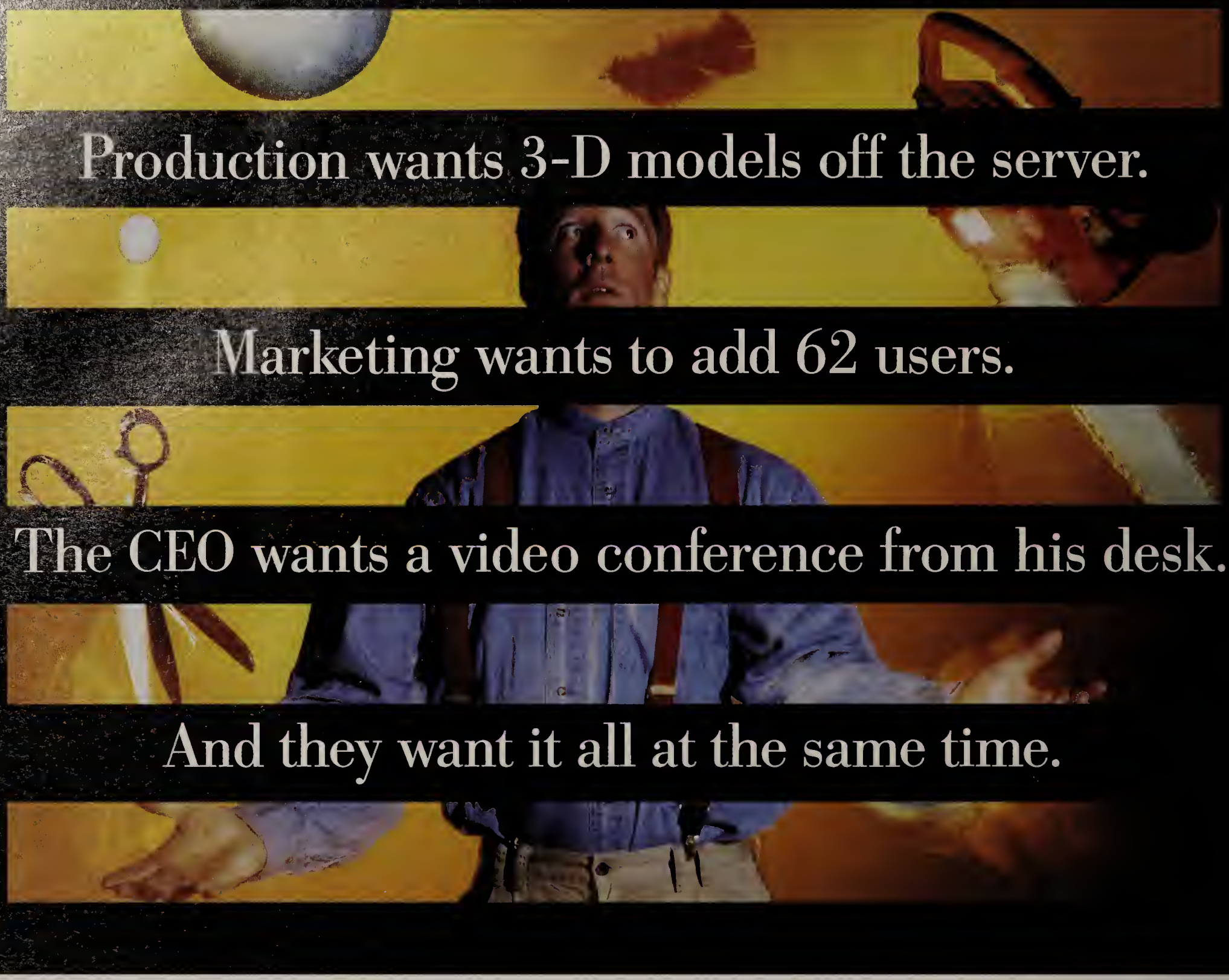

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Electronic Commerce

Covering: Tools and Techniques for Interenterprise Networking and Doing Business On-Line

Briefs

■ *This December,* **IBM** *will ship a* **World-Wide Web server** *for the MVS operating system priced on a monthly use basis of $49 to $220. IBM also plans to ship View API, an application developers' tool kit for the OS/2 Warp Web Explorer to provide an interface for client/server applications.*

IBM will port its Web server to Windows NT by the first half of 1996, later porting the software to Unix platforms from Sun Microsystems, Inc., Silicon Graphics, Inc. and Hewlett-Packard Co.

IBM also plans to expand its San Mateo porting center to include an Internet-specific section where software developers can access IBM computers or work on-site to create Web-related software.

■ **General Motors Corp.'s** *European division Opel-Vauxhall has selected Hughes Olivetti Telecom, a joint venture between Hughes Network Systems, Inc. and Olivetti Telemedia, to provide a 3,000-terminal pan-European very small aperture terminal network to link dealers through Lotus Development Corp.'s* **Notes and electronic mail.**

Through the satellite network, dealers will forward orders, request spare parts and update stock databases. The network is expected to be expanded into Eastern Europe.

■ *AT&T last week launched the* **AT&T Business Network,** *an on-line service that offers* **business news** *from a wide range of publishers, including Bunker Hill Consulting Group, CNN Interactive, Cowles Business Media, Dow Jones Business Information Services, Standard & Poor and Industry Support. The service, which includes links to the Internet, is priced at $39.95 for 10 hours.*

AT&T: (800) 660-2299.

If you build a way cool Web site, they will come

By Ellen Messmer

Even with an estimated two million people in the U.S. and Canada using the World-Wide Web to purchase goods and services, setting up a site that draws a crowd takes careful planning.

In the most extensive demographic study of the Internet to date, survey firm A.C. Nielsen Co. and the CommerceNet Consortium industry group last week asserted that 18 million people have used the Web in the last three months, and 18% of those made purchases.

But Web design consultants caution that careful planning is essential to avoiding costly technical and marketing mistakes. And unless a business can get its network department and sales division to work in harmony, a company's Web site can end up a gold-plated folly in cyberspace, said Jim Sterne, head of Santa Barbara, Calif.-based consultancy Target Marketing.

ON-LINE

Avoid Web design mistakes by reading an on-line style manual available on Network World Fusion. Link to http://www.nwfusion.com. From the main menu, select News+ then Electronic Commerce.

Web users mostly want information about your products, so give them what they want without pictures of your CEO, your building or statements about the corporate mission, Sterne said. "Frankly, they don't care about it," he added.

To attract users to your Web site, it should not only be mentioned in product literature, print and TV ads, but also on other Web sites. Cyberspace advertisements cost from $14,000 per month on the Netscape Communications Corp. Web site to $30,000 at the National Center for Supercomputing Applications' What's New home page.

A firm's own home page should include HyperText Markup Language (HTML) keywords about its business and products. These keywords, not visible to a Web user's browser, are picked up in the automated Web searches made by Web Crawler, Lycos and other services that offer a database-searchable compilation of Web links.

But before companies jump headlong into the Web, they first have to decide whether in-house staff is prepared to write HTML pages and manage a Web server with links to back-end systems.

If not, alternatives include hiring Web designers, outsourcing the Web server or leasing space on a communal server, said Mathew Cutler, director of business development at Bedford, Mass.-based net.Genesis Corp., a Web consultancy.

"Prices are all over the place for outsourcing to a Web server, with some charging $10 per page or $2 per megabyte of data transported," Cutler said.

Untold numbers of companies, ranging from large vendors such as IBM and Digital Equipment Corp. to smaller shops such as net.Genesis, are hanging out a shingle for Web consulting. With Web design in big demand, corporations looking for outside help need to look carefully at each consultant's strengths and limits, Cutler said.

Face-to-face meetings are important, he said, so companies may be inclined to use a Web design consultant in their geographic area. Not surprisingly, fees vary widely.

Companies should not overlook the possibility of training in-house staff to do content generation, Cutler advised.

"What we have found for large corporations is that employees have Internet experience from outside of work, and they are eager to learn new skills held in high esteem," he said. ■

Web site dos and don'ts

- ▲ **Get sales** and technical divisions involved up front.
- ▲ **Decide** what should be outsourced.
- ▲ **Keep content** succinct, making product information the centerpiece.
- ▲ **Advertise** the Web site in print, TV and on the 'Net.
- ▼ **Don't use** images that take time to download.

BUSINESS SPACE

Wheelin' and dealin' on the Internet

I have been promising for the last two weeks to discuss a hot topic. So here we go...gird your loins...and let's talk about getting the best deal on-line.

There are many consequences to buying and selling in an on-line environment. One is that it becomes very easy to compare prices and identify the best deal. But before we look at comparing vendor pricing, we should step back and consider how pricing will be affected by the on-line environment.

Mark Gibbs

Since, in general, all vendors are equally visible and accessible on-line, any pricing above market base level will be hard to justify. I say "in general" because there will be vendors with products that are distinguished by scarcity or added value that won't have to compete at the market's base level.

But if, for example, you currently sell widgets (and who wouldn't want to?) in the real world, you might be charging at or above the notional base retail or wholesale price as appropriate to your market.

On the 'Net, however, it won't be hard for customers to compare prices. While I don't expect on-line pricing to be much lower over the next couple of years, it will take only one aggressive competitor in any given market to trigger a price war. Run that out to the turn of the century, and you'll see the bloodiest price battles you can imagine.

For consumer products, this will force vendors to redesign their organizations for the greatest level of efficiency so they can sell as near to cost as possible. This will probably result in a huge surge of interest in workflow software and more reliance in just-in-time production systems.

As a consumer, no longer will you have to schlepp your way around multiple stores or make scores of telephone calls to find the best price and terms.

In the near future, you will be able to just point and click your way to the best price. And just watch for the explosion of consumer guides constructed by consumers themselves. It will become hard for an inadequate vendor to survive.

But it starts to get really interesting beyond the near future. A recent experiment in on-line consumer services allowed users to find the best price on-line. The service allowed users to enter the name of a compact disk, after which a number of vendors were scanned and the best price reported.

Not surprisingly, several vendors didn't appreciate this and filtered out access by the service. While this was a completely reasonable thing for the CD retailers to do, it won't work in the future. Why? Because if you block such services to try to keep prices high, you'll lose sales to those organizations that are willing to compete and are consequently more visible.

In short, the on-line world will belong to consumers, and getting the best deal will be much easier than it is today. And being a vendor will be much harder.

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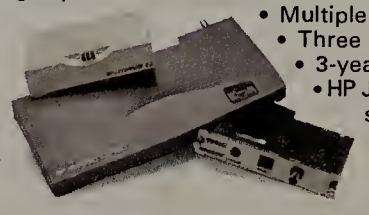

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Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Network World *tracks down answers to your questions. Please submit them to Dana Thorat via phone at (800) 622-1108, via the Internet at djt@world.std.com or via fax at (508) 820-1103.*

We run IBM's LAN Server on a token-ring LAN-based application server and have divided the hard disk into the S:, T: and U: drives.

We can only access the S: drive when we log on from Microsoft Corp. Windows NT and Windows 95 clients. We must manually connect to the T: and U: drives using the NET USE command. What can we do to connect to all three drives when we log on?

M. Jayakrishnan, India.

Use File Manager to establish a persistent connection to the T: and U: drives, says Glen Whittaker, a systems analyst with Stream International, Inc., a software reseller and support company in Norwood, Mass. Most likely, someone used File Manager and assigned the S: drive for a persistent connection.

We are running Microsoft's NETBEUI and Novell, Inc.'s NetWare on the same network. Many of our PCs hang several times a day. More frequently, though, they pause without accepting keystrokes. What's going on?

Conny Roussos, via Network World Fusion.

First, see if you can isolate the component that is causing the problem, says Ron Nutter, an Enterprise Certified NetWare engineer in the Lexington, Ky., area. To do this, load only the files required to talk to a NetWare server.

Then, if your workstation's configuration allows, load only the files needed to communicate with the network's Microsoft service.

You can also verify that the NetWare access drivers on your workstations are all the latest versions and boot your PC without memory management loaded, thus eliminating memory as the problem. In addition, ask affected users to record events in chronological order when their PCs hang.

You could also compare the configurations of machines with and without the problem to see if there are any differences.

Have wireless PBX standard, will roam

Impending TIA, ANSI standard will allow interoperability between multivendor wireless handsets and wireless PBXs.

By Neal King

For years, vendors have purposely kept the interface between digital desktop phones and private branch exchanges proprietary so customers would not turn to alternative sources for handsets. Fortunately, this is not the case when it comes to wireless systems.

Increasingly, workers who travel between sites are carrying wireless handsets, so these phones must be able to work with any wireless PBX.

The Telecommunications Industry Association (TIA) and ANSI are close to finalizing a standard that will ensure such interoperability.

The TIA TR41.6.1 Subcommittee based its development of the standard, called Personal Wireless Telecommunications (PWT), on the successful Digital European Cordless Telecommunications (DECT) standard.

Handsets that support PWT, which until recently was known as the Wireless Customer Premises Equipment standard, will interoperate with PWT-compliant wireless PBXs from any vendor.

What is compliance, anyway?

In order for a wireless handset to communicate with an arbitrary wireless PBX, makers of both pieces of equipment must agree on what comes over the air. The PWT air interface has several aspects, each of which must be met in order for interoperability to be achieved.

As part of the standard, the Customer Premises Access Profile defines the mandatory set of features that each side of the air interface must support to provide full, cross-vendor interoperability for voice services. Of course, vendors are expected to add proprietary extensions to allow additional features and product differentiation.

Much of the air interface can be described within the context of a layered protocol model, similar to the ISO's Open Systems Interconnection architecture.

The air interface comprises four protocol layers:

■ **Physical-layer protocol.** This includes radio characteristics such as channel frequencies and widths, the modulation scheme, and power and sensitivity levels. For PWT, eight channels in the 1.92-GHz to 1.93-GHz band use pi/4-DQPSK modulation.

The physical layer also specifies the framing, so each handset can distinguish the bits to which it has to listen. PWT has 12 time slots in a 10-millisecond frame.

■ **Media access control (MAC)-layer protocol.** This specifies the procedures by which the handset and the base station, or antenna, negotiate the selection of the radio channels. It also combines the channels into bearers, which may be used for duplex, simplex or double-simplex transmissions.

■ **Data Link Control (DLC)-layer protocol.** This is responsible for the sequence and integrity of frames transmitted between the handset and the base station.

■ **Network-layer protocol.** This encompasses messages that identify and authenticate the handset to the wireless PBX.

In addition to these protocol layers, other agreements condition the content of the exchange. They include algorithms for authentication and for handset-to-base station encryption, speech coding and acoustic loss plan.

In practice

The layering principle used in PWT can be illustrated by examining the handoff from one base station to another. This occurs during a call when the mobile user wanders out of the range of one base station and into the territory of another.

When the handset notices that it is having trouble with signal weakness on its current channel, it will first check if it can get acceptable signal strength from another channel (either a different frequency or time slot) to the same base station.

If there is, an exchange of messages at the MAC level secures a simultaneous change so the base station and the handset continue to carry the conversation unbroken.

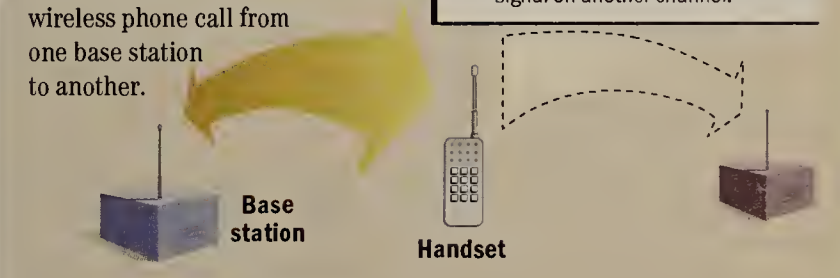
This channel change takes place without notification to the DLC layer.

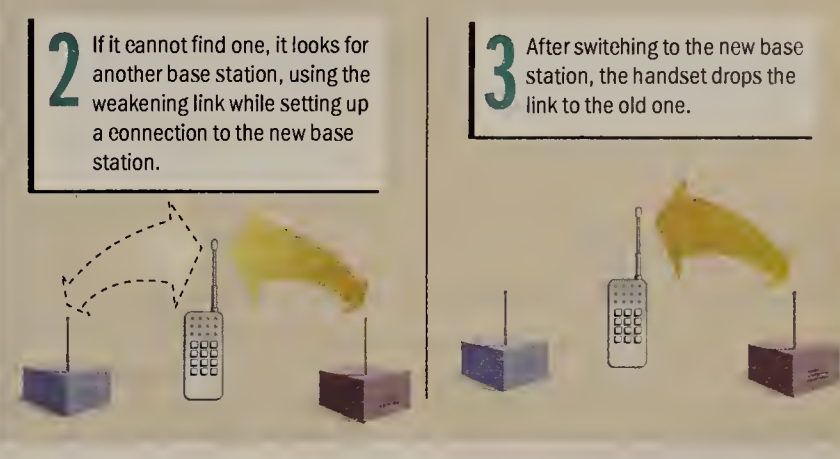
If no acceptable channel is available to the current base station, the handset looks for another base station. An exchange of messages at the DLC and MAC layers is used to secure a data link via a radio channel to the new base station, while the call through the original base station continues.

HOW IT WORKS

Keeping the conversation alive

Digital wireless systems provide a way for wireless handsets to work with PBXs from different vendors and for the transparent hand off of a wireless phone call from one base station to another.





When the data link to the second base station is set up, the handset drops the old channel and begins processing the frames received through the new one.

This takes place without notification to the network layer, so the caller and the wireless PBX are not aware that a handoff has occurred

Ready, set, action

Although the ink on the PWT standard is not yet dry, it is expected that PWT-compatible equipment will be available in mid-1996.

Full compliance may not be attained in the earliest products, in which case it is likely that a telecommunications manager can bring a deployed system into full compliance through an easy firmware upgrade or by exchanging an Application-Specific Integrated Circuit.

PWT supporters include major PBX vendors such as AT&T, Northern Telecom, Inc., Siemens Rolm Communications, Inc. and Mitel Corp., as well as radio technology vendors such as Ericsson, Motorola, Inc. and Nokia Mobile Phones. Because changes from the DECT standard have been minimal, manufacturers of DECT equipment will be able to provide PWT-compliant equipment relatively inexpensively.

King is an engineer in the systems architecture group at Siemens Rolm Communications, a Santa Clara, Calif., PBX vendor. He also is a contributor to the TIA subcommittee on wireless premises equipment.

EDITORIAL INSIGHTS

The hollow crown

The second annual Enterprise Management Summit shoot-out is history, and IBM has been crowned the winner once again. The company is crowing about the achievement, but what does the shoot-out really prove about IBM SystemView as an enterprise management product?

Not much, really.

First, net management market leaders Hewlett-Packard Co. and SunSoft, Inc. didn't participate in the 1995 shoot-out. Nor did systems management heavy Computer Associates International, Inc.

IBM faced Bull HN Information Systems, Inc., Cabletron Systems, Inc. and Digital Equipment Corp. — hardly the "major systems management vendors" IBM claims to have gone "head-to-head" with in its advertising.

Only Digital shows up on International Data Corp.'s 1994 list of the top 10 system management vendors for all operating environments. Bull makes the list for Unix, but Cabletron isn't even on the radar screen.

Those that are on the radar screen are CA, BMC Software, Candle Corp., HP, Sterling Software and Boole & Babbage. Tivoli Systems, Inc. is also considered a major player in this market.

If those vendors, and SunSoft, were present, the tests might have been the "grueling client/server scenarios" that the IBM ads claim.

But even the judges acknowledged that the tests represent only basic operations that any management product should be able to handle before even being considered for mission-critical duty.

Moreover, vendors participating in the shoot-out had months to prepare for these "grueling" exercises. There was no real-world unpredictability; so does the shoot-out really typify the problems you face everyday?

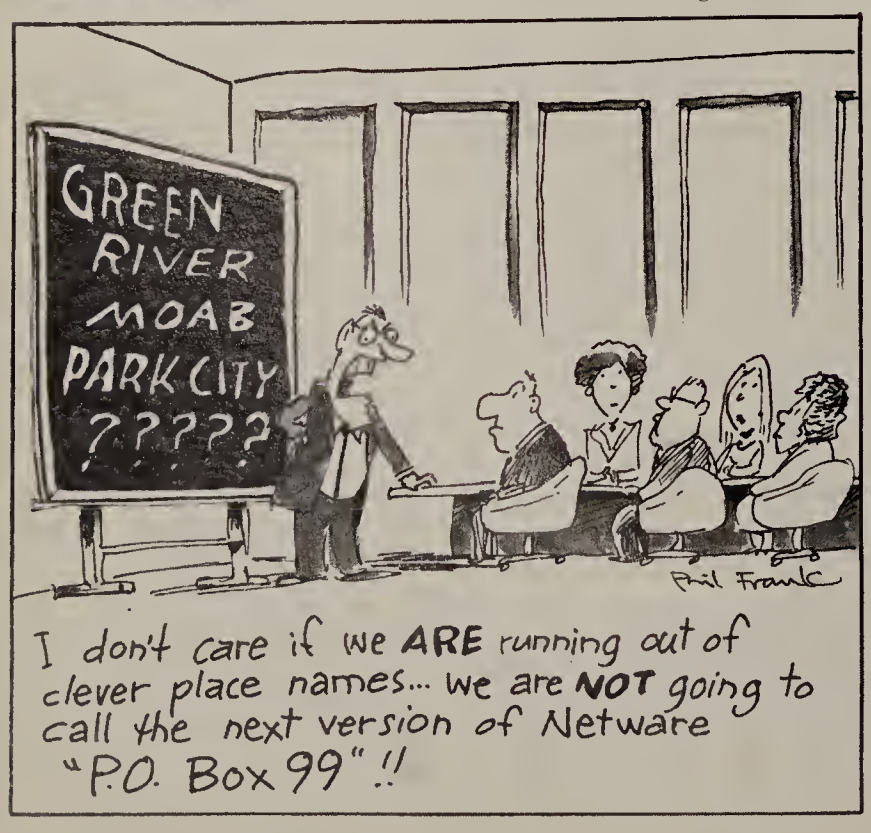
Under such conditions, it seems unfair — or at least misleading to buyers — to crown a winner. Given the complexity of management technology and the myriad customer conditions in which the products will be deployed, it's unrealistic to give one vendor a marketing edge based on such a limited benchmark.

In the future, Summit officials might be wise to forego the crowning ceremony and let attendees judge for themselves what will work best in their environments.

Jim Duffy, Senior Editor *jduffy@nww.com*

Teletoons

By Phil Frank and Joe Troise
guru@well.com



POLICY AND POLITICS

AT&T's missteps in Washington point to a political learning disability

Alan Pearce

AT&T's mishandling of the recent landmark communications legislation, which passed both the Senate and House with huge bipartisan majorities, highlights the fact that the carrier has not learned the lessons of its past political and policy-making mistakes.

It still doesn't understand that the political and policy-making establishments in Washington, D.C. play a pivotal role in the destiny of the communications industry.

AT&T's inability to learn its lesson dates all the way back to the MFJ in 1984. Had the company taken a more conciliatory posture then, it might have resolved things more favorably.

The carrier's current series of legislative miscues began last November when the Republicans unexpectedly seized power in the House for the first time in 40 years.

AT&T's first mistake was its failure to predict the involvement of House Speaker Newt Gingrich, a self-proclaimed futurist who wants to become one of the founders of the Cyber Age. When Gingrich did get involved, AT&T botched its relations with him by suggesting that there was some unethical link between the Speaker and the RBOCs.

This suggestion was based primarily on two facts: The Speaker had spent a weekend, or part of a weekend, with Phil Quigley, chairman of Pacific Telesis Group; and one of the Speaker's two daughters works for the cellular arm of BellSouth Corp.

AT&T's second mistake was that it failed to recognize that the House Republicans were new to power and, therefore, somewhat thin-skinned. So AT&T's slogan "Fix it or forget it," regarding bill H.R. 1555, was seen as offensive by the Republican leadership, which had not been subjected to hostile criticism for 40 years.

Third, AT&T compounded its problems by plunking down some $1 million, according to some reports, to launch a telegram campaign against the House bill. Unfortunately, some of the telegrams were fictitious while others were from people who had died. Naturally, this tactic incensed both Republicans and Democrats. It was a waste of time and money.

Finally, just days before passage of the legislation, AT&T attempted to publicly humiliate and embarrass members of Congress by organizing demonstrations against the legislation and paying for three-page ads in the *Washington Post,* stating that, if passed, H.R. 1555 would result in a "train wreck."

This was not an apt analogy or metaphor because it simply cannot be supported by facts. Indeed, if the industry is on a collision course of any kind, it will be a competitive collision among the major entities.

AT&T has had a long history of unbridled hostility toward federal policy-making and political institutions. Traditionally, AT&T has played policy-making hardball, a tactic that may pay off in competitive markets but is seldom successful in politics.

When I served on the staffs of the FCC and the House of Representatives, AT&T was unusually combative compared to other companies. It always seemed to me at that time that if the company had been more conciliatory, it would have won more policy and political battles. Indeed, AT&T appeared to view the process in Washington as a war while most of the senior policy makers were creatures of the 1960s, with their favorite slogan being "Make love, not war."

Washington's policy-making and political establishments are by definition consensus builders. That implies conciliation; if you want something, you must give up something.

By contrast, AT&T tends to take strong, hard-line positions that it regards as absolutely correct and, therefore, nonnegotiable.

This type of policy-making and political posturing is doomed to fail in Washington, even under the so-called new politics.

Now that AT&T has lost this major battle on Capitol Hill, it must immediately conduct an in-depth analysis of its policy-making and political strategies if it is to turn failure into success. The carrier has made a number of powerful enemies in the first year of the 104th Congress. AT&T has to mend fences fast because Congress and federal policy-making institutions will continue to play a major role in industry fortunes for years to come.

A first step is AT&T's recent reorganization. This will certainly lessen political and policy-making interest in AT&T's domestic and global dominance in services (both wire and wireless) and equipment.

The reorganization permits AT&T to compete more vigorously in these two rapidly growing markets while at the same time giving politicians and bureaucrats fewer opportunities to snipe at a vertically integrated and powerful communications giant. It might be termed a case of divide and conquer.

Fortunately for AT&T, Congress has given the FCC the responsibility for resolving most of the major competitive policy issues stemming from the legislation. Of late, AT&T has developed a fairly good rapport with the FCC and is certainly better positioned to deal with the agency than it was in the '70s and '80s.

When it comes to companies developing their domestic and global business strategies, AT&T is among the best in the world.

But when it comes to political and policy-making strategies, the carrier has a lot to learn. In the future, AT&T should closely examine its policy-making game plan.

Then, as it so rudely told our nation's leaders over the past few months, the company should "Fix it or forget it."

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C. He can be reached at (202) 466-2654.

USER FORUM

Battling bugs is every software developer's problem

Ben Rothke

A few months ago, an article in *Network World* detailed the copious number of bugs found in Cheyenne Software, Inc.'s systems backup product, ARCserve for NetWare. While the facts of the article were irrefutable, there was a very subtle supposition that Cheyenne is the only software developer to ship buggy software.

Complex software will always have known and unknown bugs. Developers are not only responsible for making you aware of the known bugs, but also for fixing them. But the unknown bugs are often difficult or impossible to detect. In heterogeneous computing environments, testing is intricate due to the multitude of unknown possibilities.

The problem that third-party software developers such as Cheyenne face with software testing and bugs is that their products must be able to work with those of numerous other companies, including operating system vendors, tape drive makers, and controller and network card manufacturers. For example, to back up a single file from a remote NetWare file server, ARCserve must communicate with the core NetWare operating system, the controller card, the network card, various NetWare communications NLMs, the Btrieve database manager, numerous protocol stacks and the physical tape drive.

Unfortunately, vendors are often reluctant to release technical information about their products to other vendors. As a result, the combination of possible errors is so immense that many developers would be hesitant to even attempt to write backup software.

I had horrendous problems with ARCserve 5.0 when it first came out in early 1994. I spent weeks on the phone with support specialists from different companies and on the Cheyenne forum on CompuServe. Finally, the problem was found to be incompatibility with the SCSI controller card. The SCSI card was replaced, and the problem was solved.

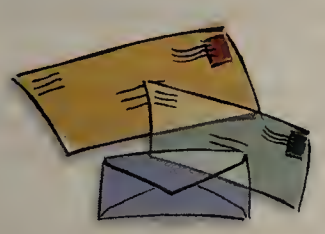
Was this bug Cheyenne's fault? Yes and no. Cheyenne did admit that ARCserve 5.0 should have had a longer beta-testing cycle.

However, Cheyenne can't reasonably be expected to test every piece of hardware in every different combination.

Software developers have never had it easy. They often face hard-to-solve technical problems where they have to deal with preposterous requests and irrational deadlines.

While that does not excuse them from writing good code and performing adequate testing, it's only fair to acknowledge the challenges software developers face and not make any one company seem like the lone perpetrator. Let he who has written bug-free software cast the first stone.

Rothke is a New York-based network engineer for Citibank, N.A. The opinions expressed are his own. He can be reached at 74710.3325@compuserve.com.



IN-BOX

Origin of 'No free lunch'

I enjoyed Mark Gibbs' column on favoritism at InterNIC (Sept. 25, page 66).

But I believe the phrase "There ain't no such thing as a free lunch" was wrongly attributed to Milton Friedman. I think it was coined by science fiction writer Robert Heinlein in his novel, *The Moon is a Harsh Mistress,* published in the mid-1960s. It's since been attributed to almost everyone.

Roy Wilsker
Manager of technology planning
The Kendall Co.
Mansfield, Mass.

Pinch me

I thought I was dreaming when I read David Buerger's recent Back to Reality column (Oct. 2, page 71), which cited a story by "an ancient Greek essayist."

"Ancient" is the proper adjective to describe the archaic logic Buerger used to refer to over half this planet's population.

I understand the cuteness used to spice up the column on AT&T's recent divestiture within its ranks.

I also understand and accept the necessity for references in this world to men and women, and believe this to be a natural state of affairs. But I don't believe I am being hypersensitive when I choose not to accept the reference to how a man feels "pinched" in a divorce by being called to task in a world that typically favors him in all other rulings.

This quote was not appropriate to the subject matter of the column and smacks of a members-only humor. As a saleswoman and contributing member of a contract manufacturing organization in the electronics industry (which, I realize, is male-dominated), I was personally excluded by the implications of the reference. For me, it destroyed somewhat the credibility of Buerger's column.

Perhaps when the majority of women are more financially successful than men, or, better yet, when there is more balance between the two, we will understand the pinch mentioned in the column.

Sherilyn Dyruff
Sales representative
Victron, Inc.
San Jose, Calif.

Differs on Diffie-Hellman

The Diffy-Hellman approach mentioned in the article "Network security without keys" (Oct. 16, page 53) is actually the Diffie-Hellman approach. It refers to Whit Diffie of the Massachusetts Institute of Technology and Martin Hellman, a professor at Stanford University.

Michael Tsai
Arroyo resident computer coordinator and computer systems specialist
Wilbur Hall
Cornerstone Research
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Managing the enterprise net

The article "OpenView House divides" (Oct. 16, page 1) clearly presents the difficult issue that users face in selecting, maintaining and developing enterprise management systems. Since IBM and AT&T walked away from the concept of systems of systems, users have realized that enterprise systems management is not one-stop shopping.

Vendors have also been struggling with product features and capabilities, pricing, distributed databases and customer support.

However, the enterprise requires systems and network management regardless of product capabilities, availability and pricing. Network managers should develop standards and internal processes to meet users' needs and increase staff knowledge, and select a management system or set of systems to help with the enterprise systems management.

Duke Power Co.'s choice of IBM's NetView for AIX in conjunction with Hewlett-Packard Co.'s OpenView is a good example of a limited set of systems. These systems are tools, and, in conjunction with enterprise standards, processes and staff knowledge, they can increase the effectiveness of enterprise systems management.

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John Gallant, Editor-in-Chief, Network World

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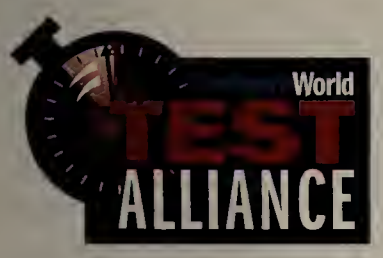
Review

From NetWare to Eternity

Surf the Internet with one of these TCP/IP gateways for NetWare.

By James Gaskin



Your NetWare users want to cruise the Internet, but you don't have the time, budget or patience to install and configure TCP/IP for each of your IPX clients. Fortunately, there is an easier way: You can turn to an Internet gateway for your NetWare server.

The four gateways we examine this week are the only products we've found that run on the NetWare file server itself. They stratify into two levels: those with minimal connectivity with no frills — Micro Computer Systems, Inc.'s (MCS) Inetix and Internet Junction, Inc.'s Passport; and those with added features and management — Firefox, Inc.'s NOV*IX for Internet and Quarterdeck Corp.'s IWare Connect, which the company recently acquired when it purchased developer Internetware, Inc.

All the products funnel client traffic through a single IP address. They effectively screen all your NetWare resources from view by the Internet at large.

These products can connect as many as 50 concurrent NetWare clients to the Internet using a single IP address, while providing excellent security against outside hackers. And they use only IPX, the native NetWare protocol, for all communication between clients and the gateway, eliminating the need to add and manage TCP/IP for LAN users.

Each vendor provides its own support for WinSock, the standard software bridge between Windows and TCP/IP, and makes the necessary programs, primarily WINSOCK.DLL, available to all users (see story, page 54). You must load and configure translation NetWare Loadable Module programs on the NetWare server acting as your gateway host.

The components of a NetWare-to-Internet gateway are:

- Server-based software executing IPX-to-TCP/IP translation.
- WINSOCK.DLL and other client files.
- Internet applications.

Some products give you Internet applications such as World-Wide Web browsers, electronic mail clients and newsreaders. Others provide just a File Transfer Protocol (FTP) program and directions on gathering freeware and shareware.

If money is not a constraint, Firefox's NOV*IX for Internet provides the most complete package, including all necessary Internet applications and considerable management capability. You'll appreciate the multiple configuration utilities and control features provided, not to mention how well the gateway works with the other Firefox products.

Providing gateways of various kinds has been Firefox's only business since back in the days of NetWare 286. This experience shows in NOV*IX for Internet's range of features and options, reliability and control.

Just the basics

Inetix and Passport are the two lean, no-frills NetWare-to-Internet gateways. Both products should appeal to companies that require a single product to support multiple gateway server platforms.

Interestingly, both systems are available on a variety of other server platforms; Inetix has versions for Windows NT and multiple Unix flavors, while Passport covers the same list but also includes Windows 3.1 and more Unix platforms.

Internet Junction licenses its IPX-to-TCP/IP translation software to Sun Microsystems, Inc. (for Sun's Netra Internet gateway) and Frontier Technologies Corp. (for its new CyberJunction gateway).

Inetix includes an FTP program preconfigured to retrieve the most popular Internet

Continued on page 50

NetResults

Product	NOV*IX for Internet	Passport	Inetix	IWare Connect
Vendor	Firefox, Inc. (408)321-8344	Internet Junction, Inc. (415) 934-3600	MicroComputer Systems, Inc. (214) 659-1514	Quarterdeck Corp. (310) 309-3700
Price (concurrent users)	$1,575 (5) $2,725 (10) $5,275 (25) $8,750 (50) $14,850 (100)	$595 (5) $1,095 (10) $2,495 (25) $4,495 (50) $6,995 (100)	$995 (5) $1,995 (25) $2,995 (50) $4,995 (51 up to host's limit)	$995 (5) $1,495 (10) $2,995 (25) $4,995 (50) $8,995 (100)
Key findings	▶ Complete application suite included ▶ Flexible user management ▶ Multiple IP addresses available, assignable by user, group or machine ▶ Optional E-mail server software available	▶ Runs on multiple server platforms, including Windows NT and various Unix versions ▶ Bypasses SPX in favor of STREAMS-based network protocol ▶ Optional SuperHighway applications from Frontier Technologies available	▶ Runs on multiple server platforms, including Windows NT and various Unix versions ▶ Filters traffic by IP address ▶ Includes FTP application	▶ Time of day restrictions available ▶ Other restrictions based on Internet applications available ▶ Optional InternetSuite of applications available

Note: Beginning this issue, full vendor contact information, including fax number, address and URL, will be available through Network World Fusion.

Continued from page 49

applications. Passport gives you locations to find applications but doesn't include them. The upside of that is you won't have applications you don't want included in the gateway price.

The downside of these stripped-down gateways is that they don't offer much flexibility. Both can restrict client access by using NetWare security or denying access to critical client software. MCS offers ways to filter IP traffic by either blocking some addresses while allowing others, or vice versa. This is a manual process today, but all gateway vendors are racing to add more management and control features.

Installation is a snap with both products. Inetix has a quick installation routine, while Passport has directions for copying a few files to the proper directories. There is little to configure for either system beyond TCP/IP details.

The Internet Junction product is optimized for performance by bypassing Novell, Inc's SPX protocol and using the company's own STREAMS-based network layer running over IPX. This advantage is muted when the gateway accesses remote Internet resources since all gateways can keep up with WAN connections that are only as fast as a T-1 line (1.544M bit/sec).

If your network can use an IPX-to-TCP/IP gateway for accessing local resources, however, the extra speed claimed by Internet Junction may be worth investigating.

We tested all the products on the Internet rather than in a lab, where fluctuating network traffic patterns make performance testing unreliable. We've found that testing over any WAN link of less than T-1 speed is dependent on the WAN, not the LAN or gateway.

Moving up the ladder

Firefox's NOV*IX for Internet is the only package of the four that includes a complete application suite as part of the gateway price. IWare Connect includes no applications, but the Quarterdeck InternetSuite is available at an extra charge.

NOV*IX for Internet and IWare Connect add considerably more management options. NOV*IX for Internet allows you to provide unique IP addresses per group, user or physical workstation (see Figure 1, page 54). Some secure applications require a specific IP address for each user for verification purposes; NOV*IX for Internet is the only gateway that can accommodate such applications.

Inetix, Passport and IWare Connect all use the Novell TCP/IP software that ships with each NetWare server. The NOV*IX TCP/IP suite can run in conjunction with Novell's software on the NetWare server, but it usually runs alone. No TCP/IP software is installed at any NetWare client.

You can tell by looking at NOV*IX for Internet and IWare Connect that NOV*IX was first to market and IWare Connect targeted specific areas that NOV*IX needs to upgrade. Where

Continued on page 54

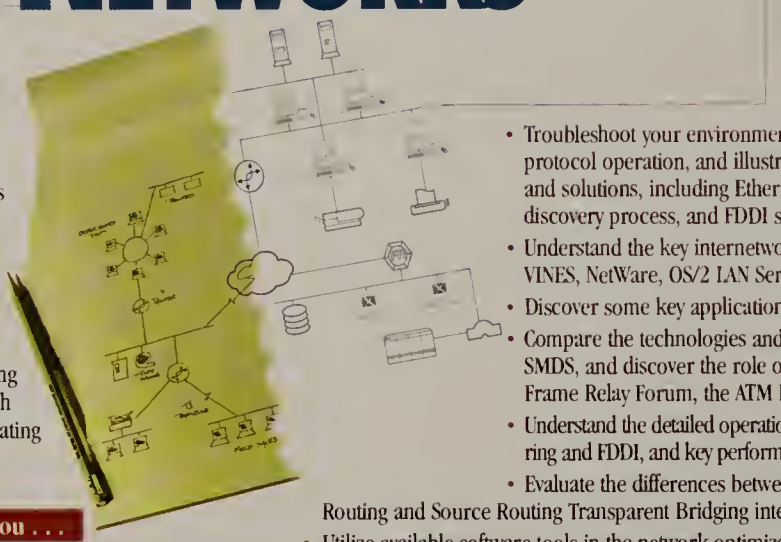
HOW WE DID IT

All gateways were tested on a Gateway 2000, Inc. 75-MHz Pentium file server with 32M bytes of RAM, a 540M-byte IDE hard drive and a 3Com Corp. 3C509 Ethernet 10Base-T interface card connected to a 3Com LinkBuilder TP/8 wiring concentrator. The external router was an Ascend Communications, Inc. Pipeline 50 ISDN system, connected to the Internet via a connection supplied by On-Ramp Technologies, Inc. in Dallas. The primary client was an Acer Open 75-MHz Pentium system from Acer, Inc. with 24M bytes of RAM, an 820M-byte IDE hard drive and a 3Com 3C509 Ethernet 10Base-T interface card.

We installed each product on the server and clients, and explored their configuration and management utilities. We tested with popular third-party Internet applications such as Netscape. Since the Internet is a constantly changing environment, where file-transfer speed and other network performance tests are less an indication of product performance than network congestion, we did not report any quantitative testing.

NetworkWorld TECHNICAL SEMINARS

Internetworking: DESIGNING LANs, WANs & BROADBAND NETWORKS



The ever-changing internetworking landscape, fueled by emerging broadband technologies, dramatically challenges traditional LAN and WAN architectures. Network professionals must now integrate local and wide-area networks with new technologies including fast Ethernet, ATM, frame relay and SMDS. These and other new technologies hold the promise of more efficient and ever-faster communications across enterprise networks.

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- Discover some key applications for narrowband ISDN technology
- Compare the technologies and operation of ATM, frame relay and SMDS, and discover the role of the broadband implementers: the Frame Relay Forum, the ATM Forum and the SMDS Interest Group
- Understand the detailed operation of Ethernet, IEEE 802.3, token ring and FDDI, and key performance characteristics of these technologies
- Evaluate the differences between Transparent Bridging, Source Routing and Source Routing Transparent Bridging internetworking standards
- Utilize available software tools in the network optimization and modeling process
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- Understand the operation of IP-based routing
- Match the appropriate LAN application with the WAN broadband technology
- Understand TCP/IP and the Internet protocol suite, including ARP, ICMP, UDP, SMTP, TELNET and FTP
- Explore the internetworking challenges of remote access and wireless communications

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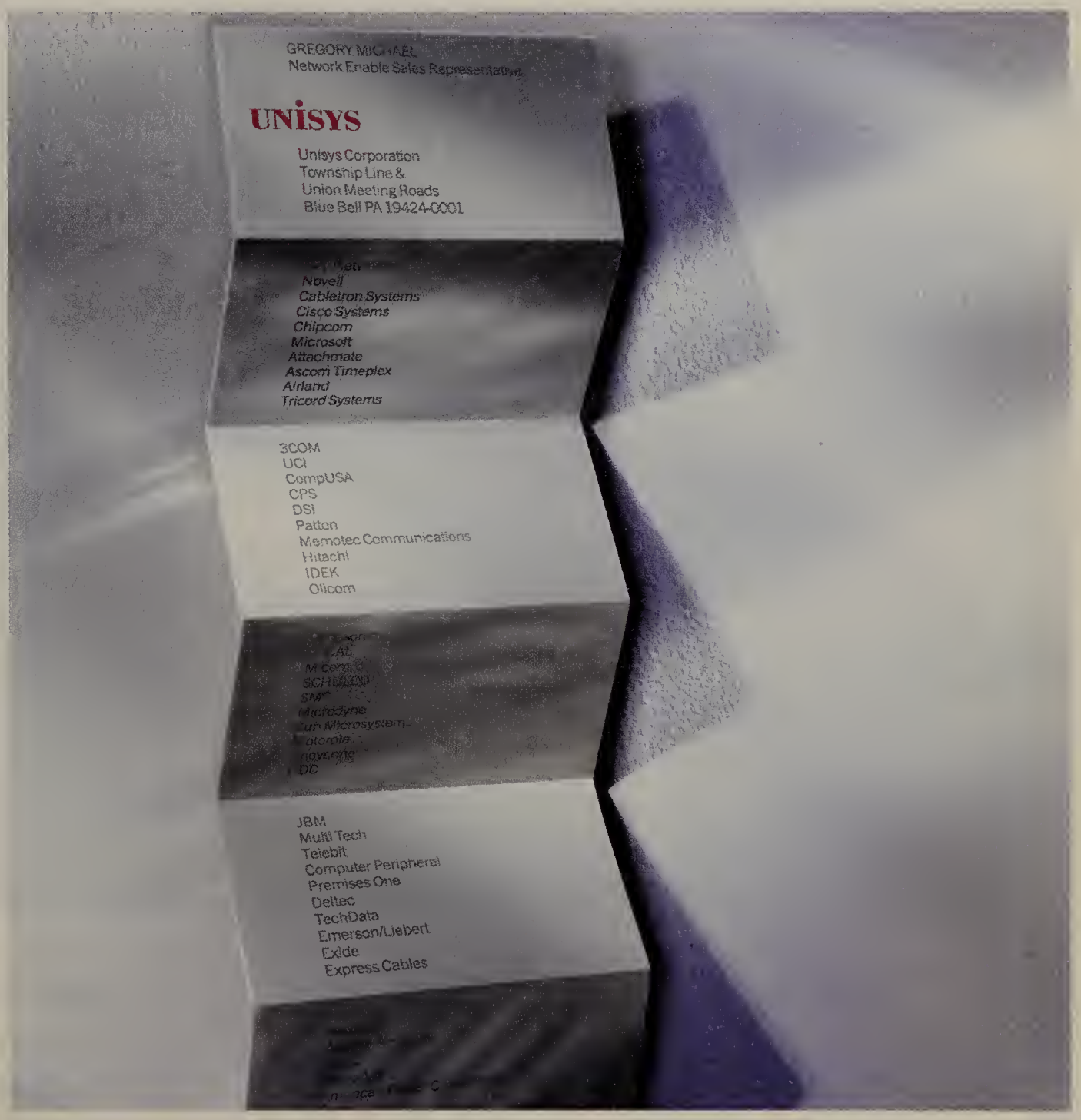

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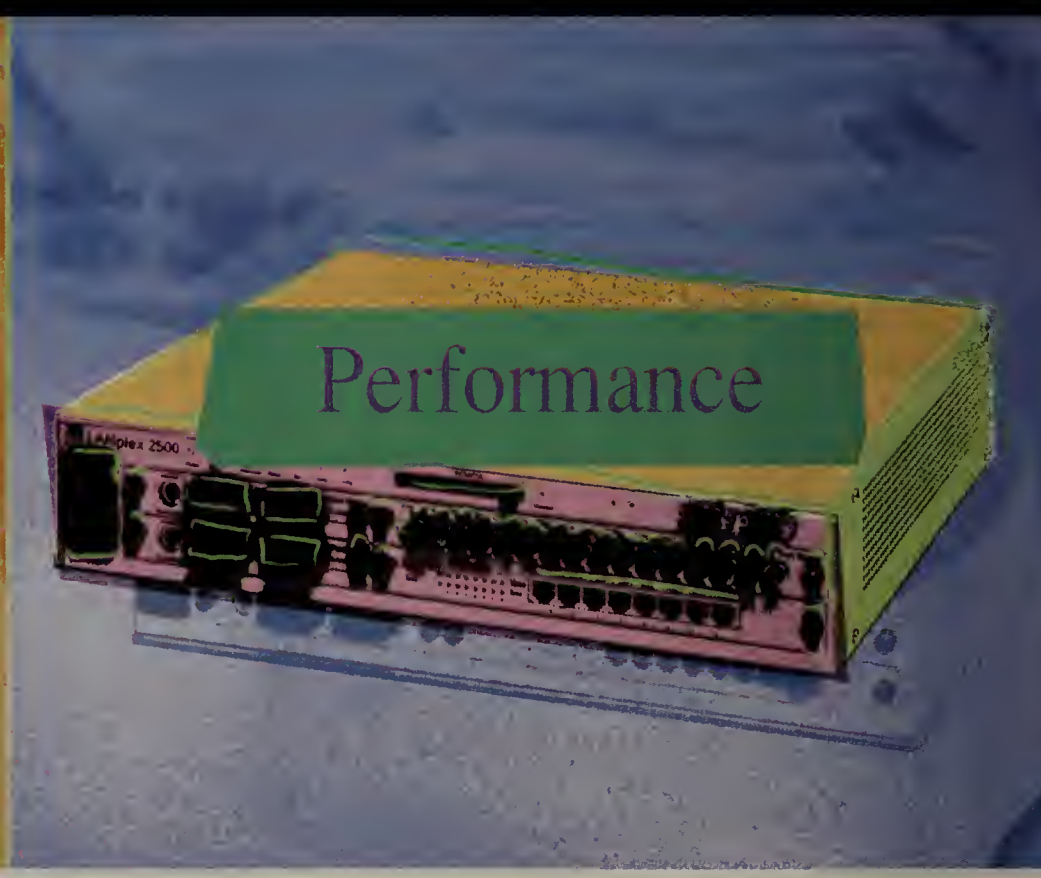

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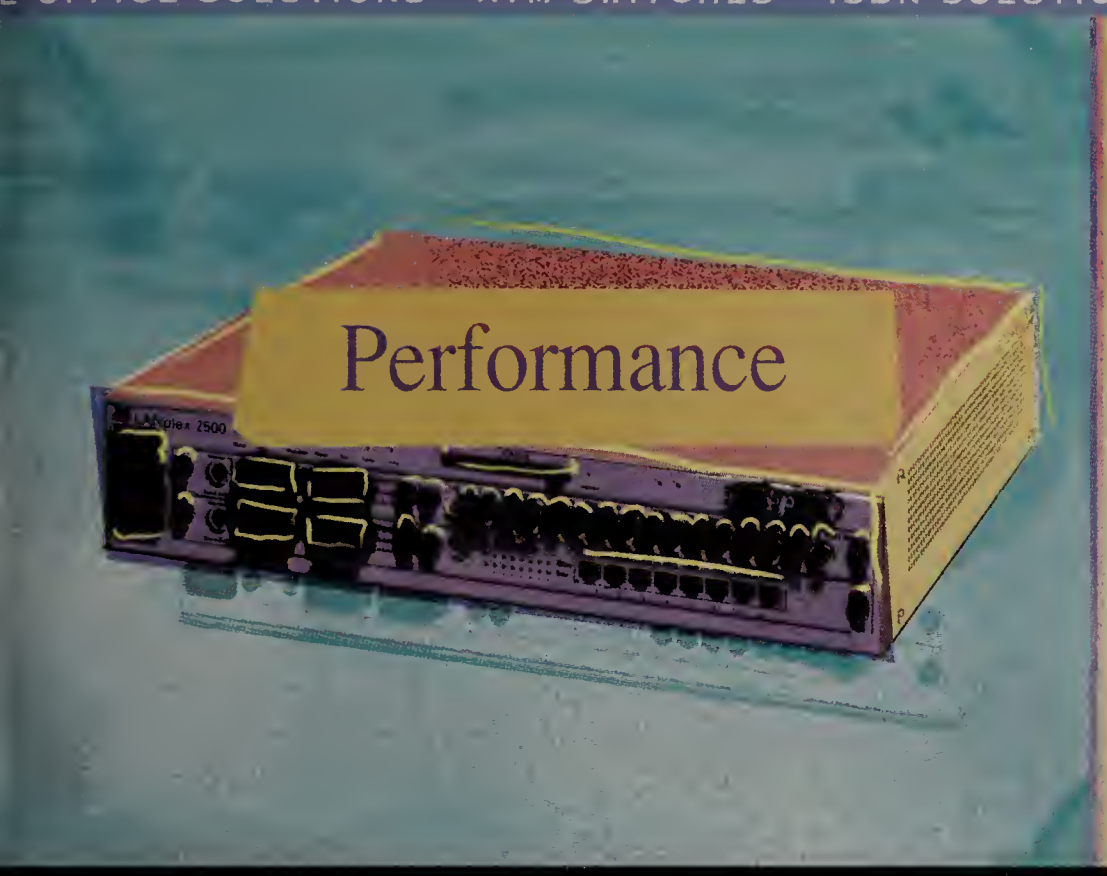

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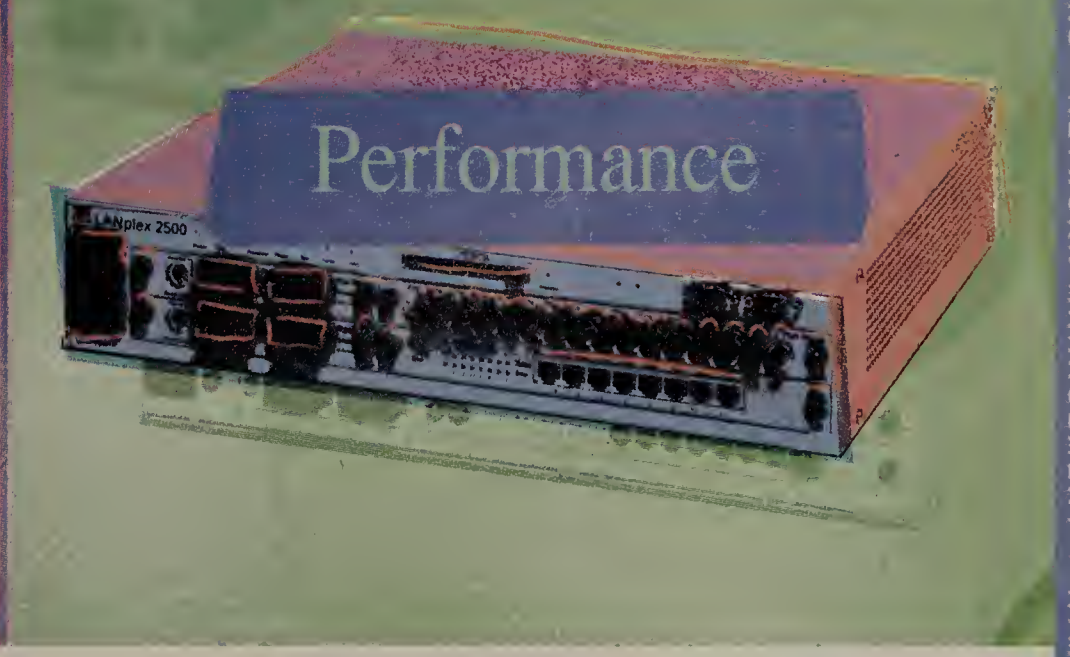

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Performance comparison based on maximum forwarding rate tests with zero packet loss. Tests performed at the Harvard Network Device Test Lab. LANplex 2500 forwarded 562,254 pps in a 1 FDDI-FDDI stream plus 8 Ethernet streams test (2/95). Cisco Catalyst 1200 forwarded 55,026 pps in a 6 stream Ethernet-to-Ethernet via FDDI test (8/94). Price comparison based on list price per switched segment.

Continued from page 50

NOV*IX has excellent user management for controlling access to Internet resources. IWare Connect can limit user access to resources, depending on the time of day (see Figure 2).

NOV*IX for Internet has the edge with IP address flexibility, since it is the only gateway product available that controls a range of IP addresses and can attach specific IP addresses to individuals, user groups or specific computer hardware addresses. IWare Connect cannot compete with that feature, but it uses Novell's TCP/IP rather than a third-party version of the protocol.

The only complaint we had about the NOV*IX for Internet application suite is that it includes an Enhanced Mosaic Web browser rather than Netscape Navigator, a browser with more capabilities. However, you will soon be able to add your Netscape application icon to the NOV*IX toolbar.

Key things we liked about NOV*IX for Internet include:

- FTP software that is fully graphical, including drag-and-drop capability.
- Highly configurable telnet software with multiple keyboard mappings.
- Complete and flexible Gopher utility.
- A private-label version of public-domain WinVN newsreader, originally developed by Mark Riordan, and one of the most popular and comprehensive available today.
- Solid E-mail client.
- Optional E-mail server module runs a full Post Office Protocol Version 3 and Simple Mail Transfer Protocol on the NetWare file server. Using this optional software, a company can run a full Internet post office on its NetWare server.

NOV*IX for Internet is also the only gateway that supports Novell's NetWare Directory Services. In fact, the scheme Firefox uses to share gateways of all types across a large NetWare network should be studied by companies new to distributed computing.

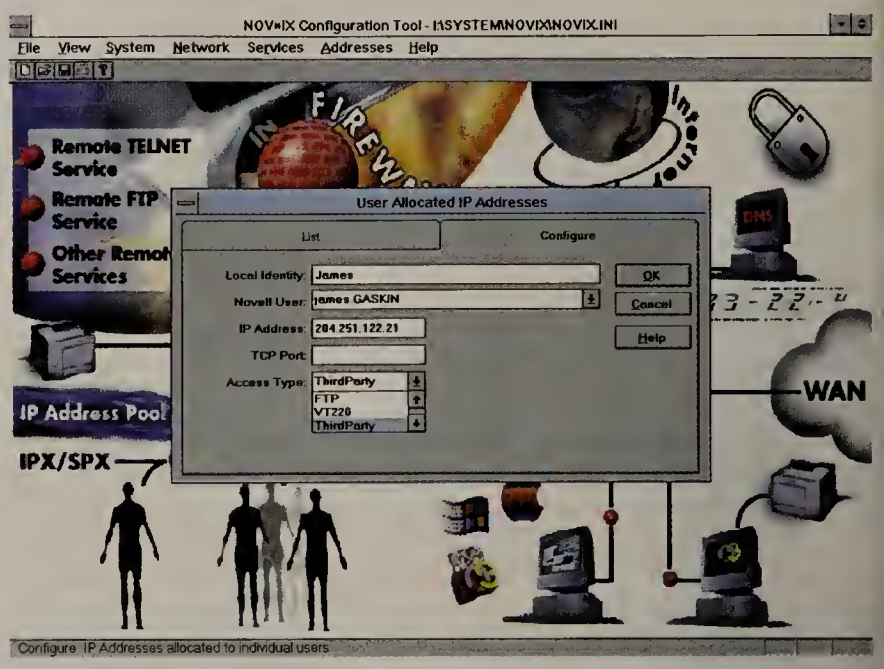

Figure 1: *Assigning an individual IP address is mandatory for some security-minded applications on large systems. Only NOV*IX for Internet provides this IP address flexibility.*

Figure 2: *Denying the ACCOUNTING group access to parts of the Internet during work hours. Inetix can configure the time settings separately for weekdays and weekends.*

Configuration confabulation

After you install any of these gateways on your server, you must set TCP/IP details, including the IP address of the host NetWare server, the IP address of the external router connecting your network to your Internet service provider (ISP) and IP addresses of your ISP's Domain Name System servers.

While WINSOCK.DLL can be installed on a server, it tends to work more reliably when installed on each client.

There are sometimes extra Windows support programs loaded on each client, reinforcing the need to visit each client even when installing any gateway (except NOV*IX for Internet, whose client software can be downloaded by individual clients if you define a configuration template and record a sample download).

WINSOCK.DLL needs no configuration on each client, but Internet applications regularly need some setup.

E-mail clients, for instance, must have the name of the E-mail server and the user name, and the configuration files are kept locally.

A nice touch in NOV*IX for Internet is a master configuration template. During software installation on the server, you can configure the E-mail, Gopher and newsreader client details. Since the servers are likely to be the same for all users on your network, this preloads the information for each client.

Applications included with Internet gateways generally may be installed on the server or on each workstation. But even NOV*IX for Internet, which can run the applications from the server, requires local storage space for personal details and work space.

Since configuration details such as E-mail address and personal user name are unique, local installation is the default option.

Of the four gateways discussed here, NOV*IX for Internet requires the most time for installation because it has the most features. Fortunately, it has an excellent configuration program interface.

WinSock it to me

Near the start of this decade, the "open systems" community of PC-based TCP/IP protocol stack vendors discovered an embarrassing fact: An "open" product from one vendor didn't work with an open product from another vendor. In other words, each TCP/IP suite only supported applications developed specifically for that suite.

At the Interop show in San Jose, Calif., in 1991, 30 vendors, including Microsoft Corp., pledged to work together to support Windows applications on all TCP/IP protocol stacks using a technique called Windows sockets, or WinSock.

WinSock was originally designed as the layer between an application (such as Netscape, Mosaic or Eudora) and TCP/IP that would enable application developers to make standard requests for network services. The protocol vendors designed WinSock software to fit their own TCP/IP stacks, but with the proper programming interfaces for all WinSock-compliant applications.

WinSock 1.1 is the current shipping version, and, technically, it accommodates only TCP/IP. So how do NetWare-to-Internet gateway products run WinSock over IPX?

The answer lies in another technique, called spoofing. Each gateway vendor writes its WinSock code to emulate the TCP/IP application interface details but connects the application to the PC client's IPX protocol for transport to the Internet gateway. At the gateway, the IPX packets are replaced by TCP/IP packets for the trip across the Internet. The process is reversed for packets returning from the Internet.

WinSock Version 2, for which specifications were released last May, builds in support for IPX and other protocols, including AppleTalk and Open Systems Interconnection. Vaguely named "new media" support for connection-oriented technologies such as ATM and ISDN is part of the new version.

When applications supporting WinSock 2 become available next summer, IP spoofing will no longer be required.

Windows 95 already implements some of the features of WinSock 2. In Windows 95, a gateway vendor can't simply overwrite WSOCK32.DLL (replacing WINSOCK.DLL) with its own version; the vendor must write a transport layer interface to slip in underneath the 32-bit Windows 95 WinSock. Unfortunately for gateway vendors, the details of Windows 95 WinSock support were not firm until late August, so today, all gateway vendors are scrambling to catch up.

Look for solid Windows 95 support early in 1996 for NetWare-to-Internet gateways.

TECH TIP: WINSOCK TO GO

Portable computers with remote node dial-up software also use a WINSOCK.DLL program. If you're not careful, the gateway client software will overwrite this dial-up WINSOCK.DLL, causing you considerable grief.

Copy the dial-up WINSOCK.DLL to the same subdirectory as your dialer software, and rename the existing WINSOCK.DLL in the WINDOWS subdirectory before installing the gateway client software.

In the office, use WINSOCK.DLL in the WINDOWS subdirectory for the gateway. When traveling, rename that WINSOCK.DLL so there is no file named WINSOCK.DLL in the WINDOWS subdirectory. This is messy, but it will work.

Where's Novell?

Good question. Novell, Inc. has floated some rumors about a NetWare-to-Internet gateway to be shipped along with a forthcoming Web server, but has released no solid specifications or details.

Novell has a spotty history with gateways of any sort. The company looked outside for an SNA gateway in the late '80s and recently spun off that product line, SAA Server, to IBM. Firefox, one of the leaders in the NetWare gateway market, now does all the work for Novell's Open Systems Interconnection gateway products.

Novell has plans to make TCP/IP more important in future versions of NetWare. This could mean that Novell's Internet gateway will push part of the TCP/IP protocol suite down to the client. This causes more management and security headaches for network managers accustomed to dealing with IPX alone, but it makes Novell look good for the TCP/IP crowd.

Another option is for NetWare to provide basic IPX-to-TCP/IP translation as a standard server function. This would go a long way in blunting criticism about mixing IPX and TCP/IP in a single company. As Microsoft's inclusion of TCP/IP in its Windows 95 product forces traditional TCP/IP vendors to focus on their applications, Novell's inclusion of IPX-to-TCP/IP translation would focus attention on gateway management, control and security.

Security details

Concern over Internet misuse is forcing more gateway vendors to add management and control features.

Ranging from the general to the specific, management and control capabilities on Internet gateways include:

- Controlling which NetWare clients have access to the gateway.
- Blocking IP addresses from all NetWare clients or client subsets.
- Blocking Internet servers by domain name.
- Stopping internal computers from running server software and accepting outside client connections.

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- Filtering newsgroups using wildcards (such as alt.*, *.sex.*).
- Controlling client access by time of day.

Part of the configuration task should include setting user access privileges. Want to block out alt.* newsgroups, but allow comp.*? That's no problem for NOV*IX for Internet. In fact, you can filter down as narrowly as you want using wildcards and even provide exceptions to your own rules. That makes it simple to limit your clients to viewing only the comp.os.* groups, block the alt.* and rec.* newsgroups, but allow rec.humor.

IWare Connect can restrict not only newsgroups, but also all telnet and X Window System sessions, E-mail, Gopher, logon and most other Internet applications. IWare Connect also has the ability to control access by time and date, making it simple to restrict newsgroup access until after business hours, for example. NOV*IX for Internet can't do that, but it offers complete IP address flexibility, by dint of providing its own TCP/IP stack rather than using Novell's.

Inetix and Passport control user access through traditional methods only: If your client has WINSOCK.DLL and the accompanying DLL programs loaded, it can use the gateway. Inetix allows you to either block some IP addresses and allow all others, or allow some IP addresses and block all others. Passport currently has no blocking available.

Four for NetWare

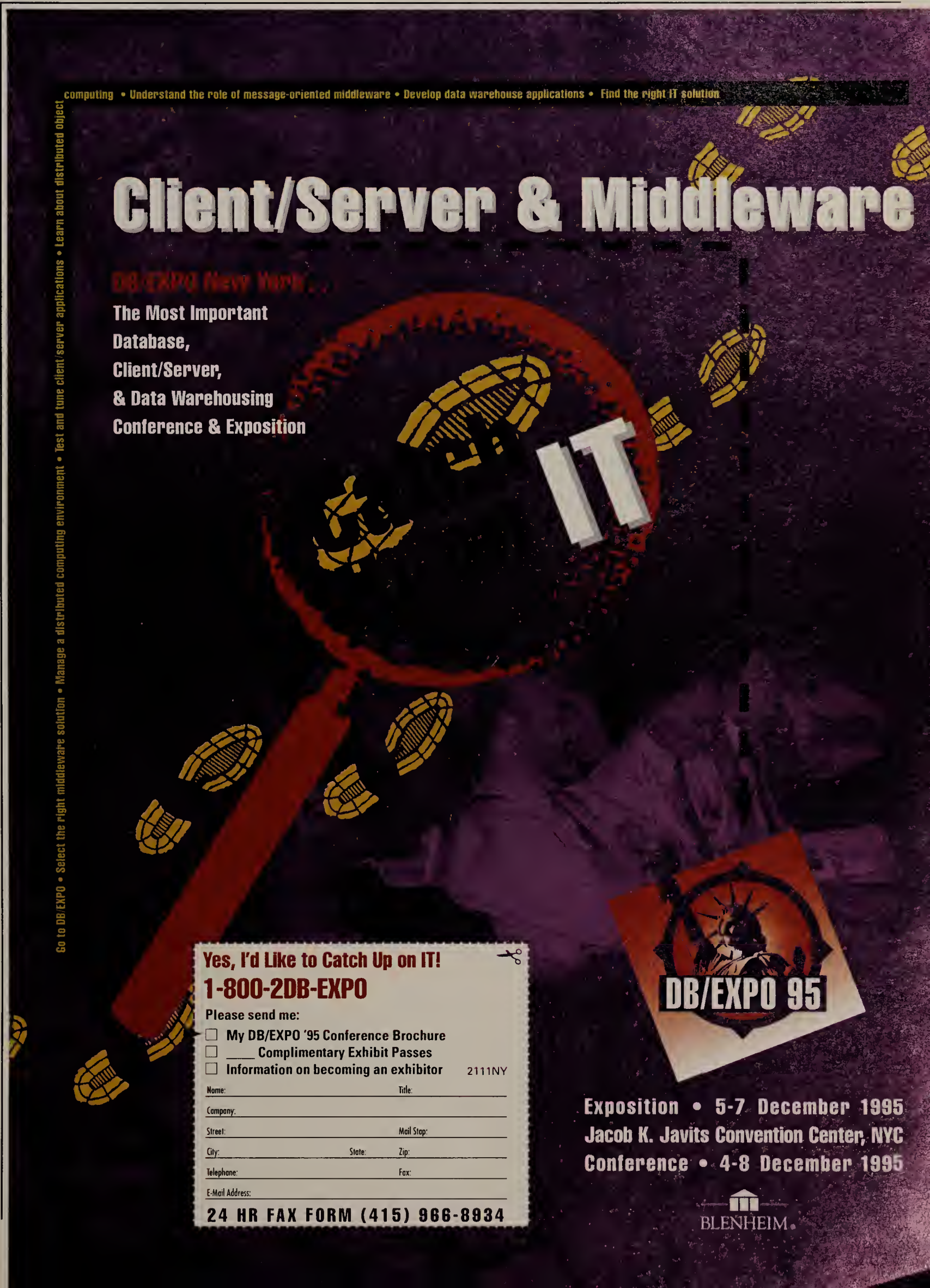
All four of these Internet gateways do a good job. NOV*IX for Internet is the most complete and flexible, followed by IWare Connect from Quarterdeck. Inetix from MCS and Passport from Internet Junction take the "just the facts, ma'am" approach: They are small, tight gateway products. Your organization's needs will determine which is most suitable for you.

What if you're not running NetWare but want to take the same gateway approach to Internet access? Later this month, we'll look at products that do just that for Windows NT, Unix and other platforms. ■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 47.

World TEST ALLIANCE

Gaskin is vice president of Gaskin Computer Services, a Dallas-area consulting, integration and programming firm, and the author of two books on NetWare. The material in this review is derived from research for his forthcoming Prentice Hall book, NetWare to Internet Gateways, *to be released in January 1996. Gaskin can be reached at jgaskin@mcimail.com.*



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ATM

CARRIER INFRASTRUCTURES

Last in a five-part series

"Frame relay, meet ATM"

You'll soon see carriers marry these two great data services.

By Beth Gage

The Berlin Wall of technology is starting to crumble. By this time next year, you should have options aplenty for doing what today is all too rare: connecting frame relay and ATM services.

You may be skeptical, having heard service providers sing this song for well over a year now. But Sprint Corp. already has frame relay-to-Asynchronous Transfer Mode service interworking available, and other carriers are responding to the pressure, promising to follow suit by the end of this year or early next.

As with other broadband capabilities, some providers' promises will be checked by equipment availability — many frame relay and ATM platforms will not support service interworking before 1996. And there are engineering and implementation issues that must be resolved once interworking capabilities are in place.

But carriers have been aware of these issues for some time, so a speedy rollout of these key capabilities is well within reason.

The term "interworking" generally has been used to describe how one technology interoperates with another. There are two types of interworking: network and service.

Network interworking is when one protocol is used on each end of a transmission but another is used in between. For example, with frame relay-to-ATM network interworking, two frame relay sites send traffic across an ATM backbone. At some point in the service provider's network, the frame relay packet is segmented into ATM cells and then reassembled into a frame relay frame before being delivered to the destination. All this is transparent to end users.

Service interworking, on the other hand, allows two sites using different protocols to communicate directly. The protocol conversion is handled by the network.

The Frame Relay Forum defines several options for the protocol conversion. For example, congestion information and discard eligibility can be mapped from frames to cells and vice versa. So if congestion occurs during the transmission of a frame, information may be mapped between the explicit forward congestion indicator (EFCI) bit in ATM and the forward explicit congestion notification (FECN) bit in frame relay.

Similarly, if a frame is marked as discard-eligible by the frame relay network, this information can be translated to the corresponding cell loss priority bit in the ATM network.

All these mappings are optional and may or may not be implemented depending on how the service provider manages its nets.

There are also two optional modes of service interworking: transparent and translation. The difference lies in the way upper layer protocol information is handled in the protocol conversion process.

With transparent mode, the frame relay header is stripped off and the entire user payload is encapsulated in ATM cells, without regard for what type of data or protocol may be in use. This mode is best used when proprietary protocols are being transported.

With translation-mode service interworking, upper layer bridging and routing protocols are mapped between frame relay and ATM. The interworking function determines if an Ethernet or a token-ring protocol is being carried and handles the conversion appropriately. While the additional software processing does add some latency, it is generally negligible (on the order of microseconds) and will not adversely affect applications.

The question of when to use translation vs. transparent mode depends largely on your network topology. If two routers that use the same encapsulation methods are communicating over a wide-area ATM connection, then transparent mode will probably be sufficient since the routers will handle the upper layer protocols similarly.

Continued on page 58

Continued from page 57

But if a router at a frame relay site is communicating across the ATM WAN to an ATM hub, then translation mode will be needed to pass along the upper layer protocol information.

How they do it

Service interworking may be available for protocols other than frame relay and ATM, although it may never occur between some services. For example, to provide service interworking between Switched Multimegabit Data Service, a connectionless technology, and ATM, a connection-oriented technology, may be extremely difficult.

Network interworking where SMDS uses ATM as a backbone network is more likely, at least in the short term. But service interworking between connection-oriented technologies is more straightforward.

The advantage that service interworking has to offer is the ability for you to choose the appropriate networking technology on a site-by-site basis without the headaches of making it all work together. This lets you optimize the network on a location-by-location basis and get the best overall price/performance.

There are basically two approaches that service providers take when providing service interworking: One is a tiered architecture, using one platform for frame relay and another for ATM. The other is to use a single, multifunction platform for both the frame relay and ATM (or time-division multiplexer) network.

In both cases, the interworking function often takes place on the frame relay port card, although some switching platforms perform protocol translation in a distributed fashion. From a technology perspective, the final result is the same with each, but there are other differences.

Other issues vendors have to address in solving the interworking problem are providing common signaling, provisioning and net management between the two protocols.

Platforms used in a tiered architecture tend to be highly scalable, capable of supporting large numbers of users. But the cost is likewise high, given the burden of managing, planning and engineering two networks. Still, most interexchange carriers (IXC) will likely follow Sprint's lead and implement service interworking in this manner since ATM nets have been architected in a tiered fashion.

The multifunction platform approach, which is often deployed in a flat architecture, allows service providers and enterprise net managers to deploy networks in a more controlled way.

While the upper end of the scalability spectrum may not be as high, the lower end, which corresponds to network start-up costs, may be more reasonable.

There also is less real estate taken up using only one switch and less resources required to manage a single platform. Local exchange carriers are more likely to use this approach since their frame relay and ATM networks are usually much smaller than those built by IXCs.

Other issues vendors have to address in solving the interworking problem are providing common signaling, provisioning and net management between the two protocols.

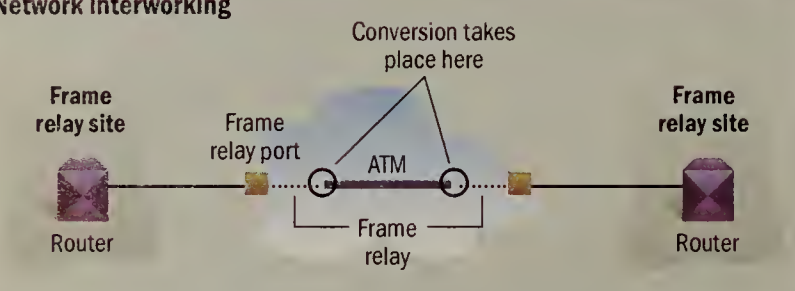
For the most part, there are no technical limitations with converting a frame relay committed information rate (CIR) to an ATM sustained cell rate. Most switch vendors even support mapping a zero CIR frame relay permanent virtual circuit (PVC) to any ATM class of service the carrier chooses.

But the ability to reroute PVCs from end to end is an important consideration. While rerouting is generally supported within service "clouds," verify with your service provider that there is no single point of failure at the point where the protocol conversion is accomplished.

If your provider is performing service interworking across a multivendor platform, make sure it can still provide rerouting end to end.

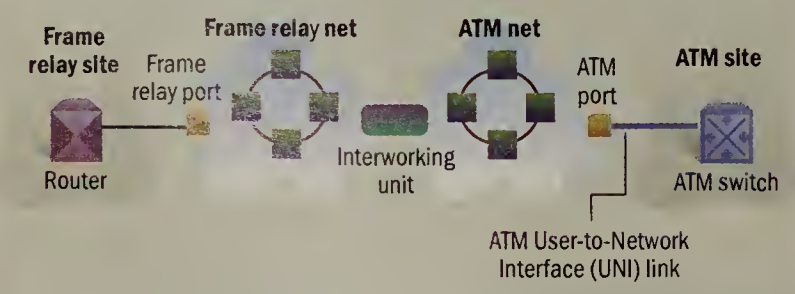
Choose your weapon

Network interworking



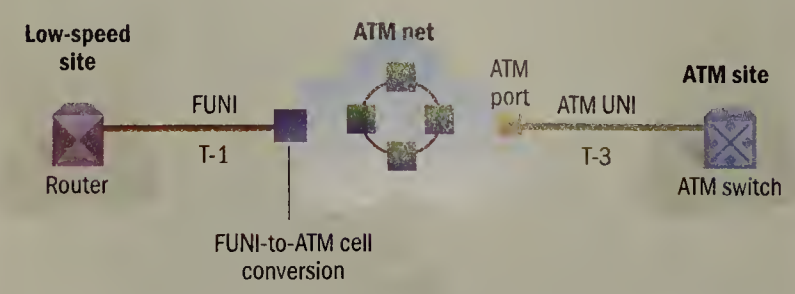
With network interworking, frame relay packets are transported across an ATM backbone between two frame relay sites. Frame relay PVCs are mapped directly to ATM virtual connections.

Service interworking



Service interworking allows a frame relay site to communicate with an ATM site. The interworking unit – often part of the frame relay switch – provides the translation, mapping information in the frame relay header to the ATM cell header.

ATM FUNI



The ATM frame-based user network interface (FUNI) provides functionality similar to service interworking but with the same signaling and management functions since only one network is used. There is little difference from the end-user perspective.

GRAPHIC BY SUSAN PULASKI

Who'll have what when

Here is a snapshot of where the major switch vendors are in terms of providing interworking support.

■ **AT&T Network Systems.** AT&T is taking the tiered approach — its Globeview 2000 provides a high-speed ATM backbone while its BNS-2000 and other devices act as edge vehicles.

AT&T currently provides network interworking for frame relay and SMDS through BNS-2000 ATM trunk modules, and plans to provide service interworking through a family of edge vehicles, including the BNS-2000. AT&T is also planning to provide a global network management system to assist service providers in the provisioning of frame relay-to-ATM connections. It has not yet given rollout dates for those enhancements.

■ **Cascade Communications Corp.** Cascade has been supporting network and service interworking between frame relay and ATM since early this year on its BSTDX-9000 platform. Both transparent and translation modes are supported for service interworking. An ATM interworking module on the BSTDX-9000 provides either service or network interworking.

Eventually, support for service interworking between frame relay and ATM will also be provided on the Cascade 500 platform, which will be released at the end of the year.

Carrier frame relay-to-ATM interworking scorecard

Carrier	Switch platforms	Delivery
AT&T	AT&T Globeview 2000; StrataCom BPX	By end of this year
LDDS WorldCom	NEC NEAX-61E; StrataCom BPX	Controlled delivery this year; general availability Q1 1996
MCI	GDC APEX-NPX	Early 1996
Sprint	NEC Model 10; Hitachi AMS 5001	Available now

Cascade also plans to support service interworking between SMDS and ATM protocols, although its approach to interworking the connectionless SMDS protocol and connection-oriented ATM is not yet solidified.

■ **General DataComm Industries, Inc.** GDC's APEX products, which include the NPX, DV2, MAC and MAC1, are multifunction platforms with support for both frame relay and ATM. The interworking is done on the frame relay card in the APEX switch. Network interworking is supported now, and service interworking between frame relay and ATM is planned for early 1996.

■ **Newbridge Networks Corp.** Newbridge approaches service interworking using a single platform — either the MainStreet 36120, Newbridge's frame relay platform, or the MainStreet 36170, its ATM backbone switch. From the 36120, a frame relay-to-ATM module provides the conversion for an entire frame relay trunk rather than one connection or port at a time. Newbridge currently supports network interworking on the 36120; service interworking will be provided early next year.

On the 36170, the conversion is done on a card level rather than on the aggregate. Service interworking between frame relay and ATM on the 36170 will be available with the addition of frame relay cards, which will be released for service trials in December.

■ **Northern Telecom, Inc.** Nortel provides frame relay-to-ATM interworking at the edge of the network in its multifunction Magellan Passport platform. Protocol translation is provided on the frame relay card, while the ATM card provides the segmentation and reassembly of frames into cells.

Today, Nortel supports network interworking on the Passport, which can be deployed in a flat architecture or a tiered one with Magellan's Vector and Concorde switches. Nortel's direction is to support translation-mode service interworking first, with transparent mode to follow if demand warrants.

■ **StrataCom, Inc.** StrataCom has a tiered architecture approach for interworking, with its BPX acting as the core ATM platform and the IGX or Axis shelf acting as the frame relay access platform. StrataCom recently unveiled support of service interworking between frame relay and ATM, and it is available now. Network interworking has been supported for some time.

Where does FUNI fit?

A recent arrival on the ATM scene is the frame-based user network interface, or FUNI. FUNI, simply put, has muddied the waters for end users, carriers and vendors. It was designed to provide ATM functionality for data transport at T-1 levels and below, making it an alternative to frame relay interworking.

Basically, FUNI yields the same results as service interworking but with a few additional capabilities. Because it is an ATM interface protocol, FUNI will support common signaling as well as network and traffic management functions between cell-based and frame-based sites.

But FUNI's biggest advantage is that it will support ATM switched virtual circuits (SVC), whereas work on standards for service interworking between frame relay and ATM SVCs may not be finalized for another year.

Most equipment vendors are planning to provide FUNI support by mid-1996 along with frame relay-to-ATM interworking, which will allow customers to take their pick.

Others are hanging back to determine what the demand for FUNI will be before committing to delivery.

When FUNI should be chosen instead of service interworking is still a matter of debate. The question is not so much the bandwidth required, but rather the functionality required by network locations.

If you have hundreds of existing frame relay sites, it may not make sense to upgrade routers to support FUNI. In more ATM-centric networks, providing full ATM functionality at low speeds for data transport may be necessary.

The deciding factor between frame relay and FUNI is the type of signaling needed. In the short term, each probably will be supported on an ATM network. In the longer term, the functionalities of frame relay and FUNI may merge, leaving no distinction between the two.

First on the scene

Service providers have been putting off the delivery of service interworking for two main reasons: The first is a lack of finished standards for interworking and a corresponding lack of equipment that supports it.

Second, it has taken considerable development effort to provide operational and administrative support for service interworking in carrier provisioning, billing and net management platforms.

But Sprint has hit the streets using a rel-

Continued on page 60

Put it to your provider

Reprising the five-part series: Key questions to ask your ATM service provider.

- Do you offer application-based Asynchronous Transfer Mode services that include equipment, management and maintenance options targeted at solving specific business problems?
- What ATM classes of service are offered, and which classes do you assign for what applications (for example, constant bit rate assigned for circuit emulation, variable bit rate-real time for video broadcast)? Can you help with the assignment of quality-of-service parameters based on the application?
- Is oversubscription of the ATM port supported?
- How is automatic rerouting of virtual connections accomplished should an equipment or line failure occur?
- What platforms are used to support frame relay-to-ATM service interworking? What modes are supported for service interworking, and when should one be used vs. another?
- How is automatic rerouting of a frame relay-to-ATM service interworking connection accomplished?
- For service interworking with frame relay, what ATM class of service is the frame relay permanent virtual circuit mapped to?
- What customer network management capabilities are offered?
- What performance reports are provided with the service?
- How does the ATM network handle policing and traffic management? How are these functions supported for service interworking connections?

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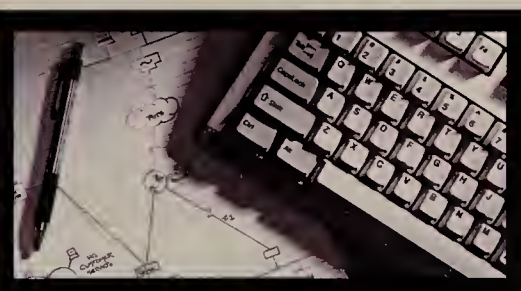

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Continued from page 59

ethely new edge switch from Hitachi Telecom (USA), the AMS 5001, to provide the frame relay-to-ATM service interworking function.

Frame relay traffic is aggregated from Sprint's frame relay network, based on Alcatel Data Networks, Inc.'s 1100 TPX, onto a T-1 frame relay interface on the AMS 5001.

The AMS 5001 then aggregates frame traffic as well as T-1 ATM traffic onto high-speed ATM connections to be carried over the core ATM network.

Burst Express PVCs — which are zero CIR PVCs, the only type Sprint supports with service interworking — are mapped one-to-one to ATM virtual connections using translation or transparent mode of service interworking.

The result is an end-to-end service for wide-area LAN interworking with port speeds that range from 56K to 155M bit/sec.

Other carriers are giving only delivery dates for service interworking (see graphic, page 58).

Bottom line

The reality of today's network requirements is that few customers have high-bandwidth multiservice ATM networks. Of all the digital bits that are transported in a day, the overwhelming majority are for voice traffic, and ATM has a long way to go before it penetrates that market.

Another reality is that frame relay has taken off while ATM is still in its infancy. But many frame relay network managers are finding that 1.5M bit/sec is not enough for central locations that support many remote sites.

The bottom line is that there is more need for service interworking to solve this problem than there is demand for "pure" ATM networks.

The bottom line is that there is more need for service interworking to solve this problem than there is demand for "pure" ATM networks.

Service interworking supports the star network topologies still in use by most corporations, which makes frame relay and ATM work together to support the underlying applications.

It provides flexibility in network design and optimization, investment protection and allows carriers to offer a smooth migration path between frame relay and ATM.

And its time is now. Service providers have had over a year to get their operational systems in order.

Now that equipment vendors are finally delivering support for service interworking, there is no reason for commercial availability to be delayed any longer.

Gage is a consultant at TeleChoice, Inc., specializing in ATM and other broadband services and equipment. She can be reached at (201) 239-0700 or at beth_gage@mail.telechoice.com.

The first four installments of this series can be found on Network World Fusion, along with hotlinks to other sites with additional information on relevant ATM topics.

There's also lots more general information on ATM all over the Web -- we killed a good two hours looking for stuff without even trying.

Among the better sites we stumbled upon is one operated by David Blight at the University of Manitoba in Winnipeg. It has links to Web sites with info on various telecommunications issues, including ATM. We found another called ATM Information Resources that has links to ATM-specific Web pages on everything from standards to test beds with names like BATMAN (Boulder ATM Area Network). And not to be missed is a paper titled, "Why ATM is like a Nose," a tongue-in-cheek look at technical complaints and objections about ATM.

All this and more can be yours if you point your browser at **http://www.nwfusion.com.** From the main menu, select **NetRef, Technology Resources** and then **Broadband Networks.**

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Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

Digital Tools, Inc. *has released* **AutoPLAN II 3.0,** *a new version of its client/server-based project management software for workgroups.*

The new version can notify users of project delays, resource overallocations, cost overruns and other key events via an internal Inter-Project Bulletin Board or via the Internet. Other features include a multiproject interactive resource Gantt chart, a report writer with 40 predefined reports and shared chart layouts.

Digital Tools: (408) 366-6920.

Andersen Consulting *has created a* **Foundation Software Organization (FSO)** *that will help customers build client/server applications.*

The 600 FSO professionals worldwide will help customers use a number of Andersen Consulting offerings, including its:

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- **Install/1** mainframe development environment for IBM CICS.

Andersen Consulting: (312) 580-0069.

Learning Tree International *has developed a* **Windows NT Systems and Networks** *certification program, scheduled to be offered for the first time in January.*

The program will teach students to install, configure, troubleshoot, optimize, support and upgrade Microsoft Corp. Windows for Workgroups, Windows NT and BackOffice-based networks. Students will also learn to use Windows 95 net features, establish network and resource security, and integrate Windows nets with Novell, Inc. NetWare- and TCP/IP-based internetworks. To receive a certificate, students must successfully complete five courses and associated exams.

Learning Tree International: (800) 635-5610.

Electronic monitoring breeds employee mistrust

By Mark Gibbs

Establishing a workable level of trust with employees is among the most profound of people management problems and one compounded by the computerized surveillance that networking technology makes possible.

The nets and computer-based processes that have made organizations more nimble are now looked upon by management as something for workers to abuse. The fear is that employees will waste time playing computer games, transmit confidential material to outsiders or inappropriately use communications systems in some other way.

As a result, management has extended the use of networks and computers to monitor processes that traditionally were not amenable to supervision. Now it is possible to monitor telephone calls, data transmissions, the location and use of vehicles, access to data services, and even the rate and content of individual keystrokes at every computer in the organization.

Add groupware to these automated surveillance techniques and management can monitor workflow in a way that ensures that even the smallest deviation from the norm or lapse in performance can be identified automatically and instantaneously.

In this kind of environment, it is hardly surprising that many workers say they feel the heavy hand of big brother. People tend to respond vehemently to any kind of control that is outside of a normal bureaucratic process and frequently interpret surveillance as a breach of privacy.

Readers responding to a *Network World* article that asked whether a firm should be able to track the location of its trucks were equally divided, but those against the practice were more impassioned. (See the Network World Fusion graphic on this page for how to access the original story and reader responses.)

What if a similar question about whether a company should engage in keyboard monitoring or electronic mail scanning were asked? Would we get the same split? (Let us know by jumping into the Forum area on Network World Fusion.)

I suspect we'll get a large vote against. Why? There is not much workers can say about monitoring as an employment condition. Employees are usually required to clock in and out, produce progress reports and prove they are doing their job.

So why not use computerized monitoring to make sure the clocking-in gets done and reports get generated? Because even though there seems to be logic behind engaging in electronic surveillance, it is an insult to do so in most businesses. The practice leaves staff feeling demeaned and humiliated. In effect, staff is being told they cannot be trusted. Worse, that mistrust extends down to the level of every press of a key and every byte of data sent and received. It is mistrust by the millisecond.

But there are business environments in which monitoring may be appropriate. For example, a firm developing products might use E-mail monitoring to prevent intellectual property from being compromised. Even then, the implications of monitoring may well damage team spirit and staff commitment.

Nonetheless, if you feel staff must be monitored, keep staff emotions in mind and develop a policy that explains why the firm is doing it, how far it will go and what is done with the information (see graphic).

If you devise a good policy, you stand a chance of making a computerized surveillance scheme work. But do not expect the plan to be happily accepted.

Gibbs is a consultant and writer based in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@gibbs.com.

Surveil yourself

Here are a few actions to take as you craft an electronic surveillance policy.

- Ensure that surveillance is not used to make up for inadequate management skills. If it is, surveillance will drive another nail in the coffin of your attempt to build trust.
- Explain why surveillance is being introduced. Be sure to run a draft of the explanation by key staff for reaction and modify it as needed to avoid having it misinterpreted as a license to invade privacy.
- Create a bill of rights that explains how surveillance records will be used. An oversight committee comprised of staff and management can help create an atmosphere of cooperation.
- Ensure that the surveillance scope and level of detail is defensible. Remember, the staff will rarely find it acceptable to collect anything beyond the highest level of detail.

Tap into Network World Fusion to see what fellow readers had to say about whether a trucking company should be able to use networks to keep tabs on the location of their trucks. Select Forums, nwfusion.talk, then "Truck 54, where are you?"

While you're there, let everyone know how you feel about whether a company should engage in such activities as keyboard monitoring and E-mail scanning. When is it permissible and when isn't it? What does management get out of the practice, and what's the risk?

Network World Fusion

Microsoft program release helps teachers design on-line courses

By Jim Brown

Microsoft Corp. has announced a curriculum consulting program intended to make its Microsoft Online Institute (MOLI) courses available to more users at less cost.

The Learning Advisors program will help third-party Microsoft Authorized Technical Education Center (ATEC) operators adapt their existing Microsoft product courses to be taught via MOLI, which is accessed over The Microsoft Network (MSN), instead of just in classrooms. ATEC operators who pass a Microsoft certification program will become Online Classroom Providers.

MOLI's *course catalog home page.*

Some 60 courses offered by more than 30 organizations are already available via MOLI — most at a great cost savings. For instance, Microsoft says a classroom course that costs $2,800 is being offered for $395 on MOLI.

Developed in conjunction with the Masie Center, an instructor training outfit in Cambridge, Mass., the Learning Advisors program will help training firms develop interactive courses that enable students to learn at their own pace and consult with course advisors and other students as needed via electronic mail and chat groups.

The Learning Advisors program will also aid teachers rooted in classroom instruction in making the transition to an on-line environment. Teachers will not only learn instructional and motivational techniques to use in the on-line world, but also how to evaluate student progress on-line and set up student tutoring groups.

In addition, teachers will learn to use MSN software, such as forum management tools and software templates for on-line curriculum development.

For more information on MOLI, send E-mail to moli_mktg @msn.com. ■

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Design and develop network management agent applications software for hubs, residing in an embedded system environment with multi-tasking kernel, network management engine, and 68K or 80X86 equivalent microprocessors. Requires a BSEE/CS, MS preferred; 3+ years' software development experience. Background in RMON or related SNMP agent applications is preferred. UNIX/C skills a must. Knowledge of internetworking issues with bridges and routers is a plus. **Code JD/ASE**

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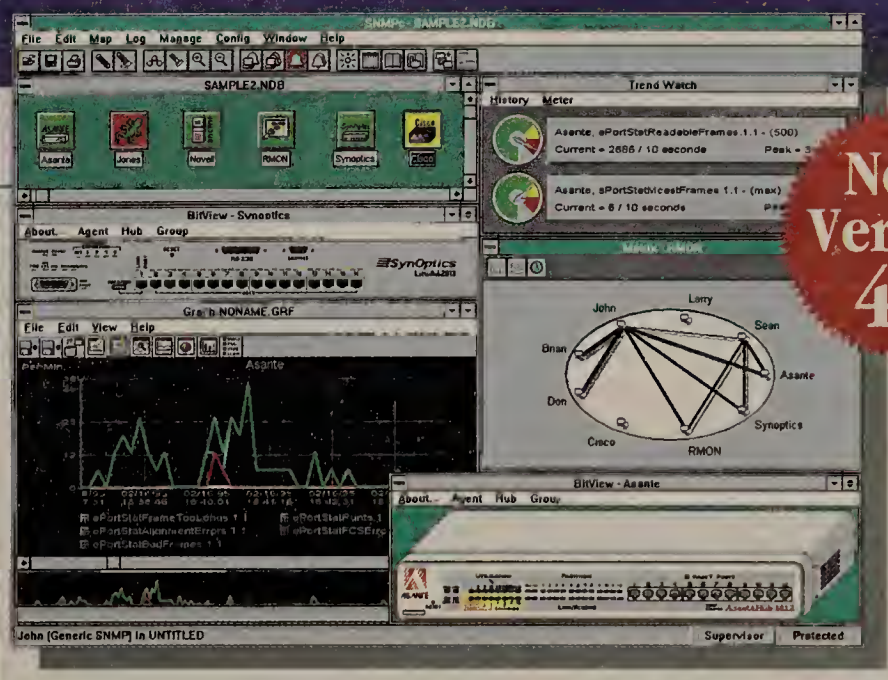

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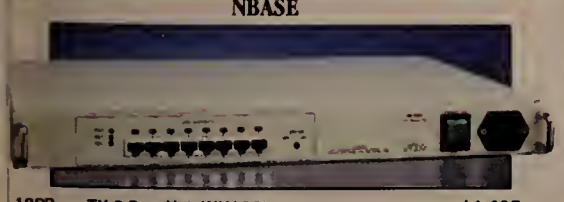

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100 Base-TX 12-Port Stackable Hub (3C250-TX/1) $2,028

100 VG-Any LAN Hubs

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24-Port 100VG-AnyLAN Hub (TCVG050-UTP) $2,625

Katron

100VG-AnyLAN Hub, 6-Port/12 Port (0P1006/0P1012) $840/1,330

Hewlett Packard

Advanced Stack 100VG 15-Port Hub,Stackable up to 16 Hubs
(J2410A) $2,262

10/100 Switches

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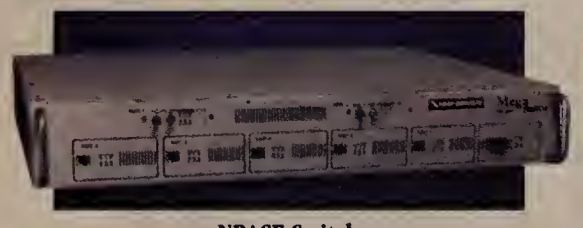
New MegaSwitch Seven 100 Mbps Ports,
UTP and Fiber Capabilities (NH2007) $6,500



NBASE Switch

MegaSwitch 6 AUI/RJ45 Ports,Plus 2 Slots for
NH200MP & SNMP (NH208-10) $3,499
MegaSwitch 6 AUI/RJ45,Plus 7 RJ45 Ports, Plus 2 Slots for
NH200MP/SNMP (NH215-10) $6,999

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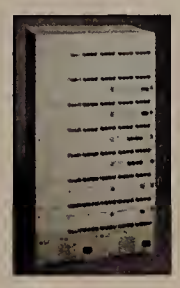

PROStack EtherSwitch Stackable
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speed modules, 10Base-TX/ATM
(PSP16-M001) $6,370
(PSP16-M041) $7,095
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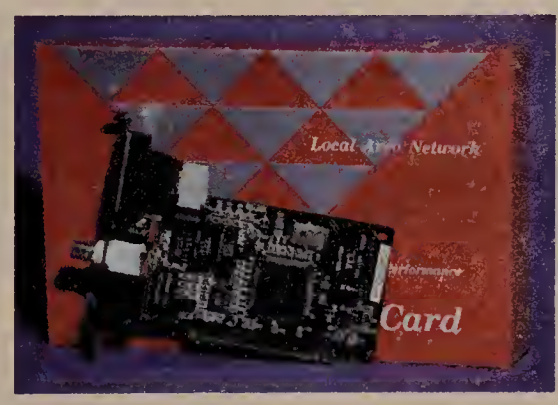
ISA BNC (ENET16C) $37
ISA RJ45 (ENET16T) $37



ISA RJ45/BNC (ENET16CT) $41
RJ45/BNC/AUI (HT2100PCI+PCI) $99
RJ45/BNC/AUI (HT2100VL VLB) $99

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ISA RJ45/BNC (LANET16C) Single/6PK/24PK $137/795/2,902
EISA Combo (SMC-E32C) Single/6PK $201/1,127
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ISA PRO/10 RJ45 (PCLA8220A) Single/5PK/20PK...$94/418/1,510
ISA PRO/10 RJ45 (PCLA8225A) Single/5PK/20PK.....$106/450/1,655
EISA RJ45/BNC/AUI (EILA8225) Single/5PK.....$217/954
PCI RJ45/BNC (PCLA82) Single/5PK/20PK.....$162/767/2,807

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ISA RJ45 (3C509B-TPO) Single/5PK/20PK $99/445/1,630
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Single/5PK/20PK $119/558/2,039
EISA RJ45 (3C579TP) Single/5PK $239/1,019
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SNMP Upgradeable (NH100) $495
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SNMP Master (NH102) $815
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24-Port 10BT Hub,SNMP Slave (NH114) $950
24-Port 10BT Hub,SNMP Master (NH114) $1,150

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12-Port 10BT Concentrator (SMC3512) $625
26-Port 10BT Hub TigerStack (SMC3326TC) $935

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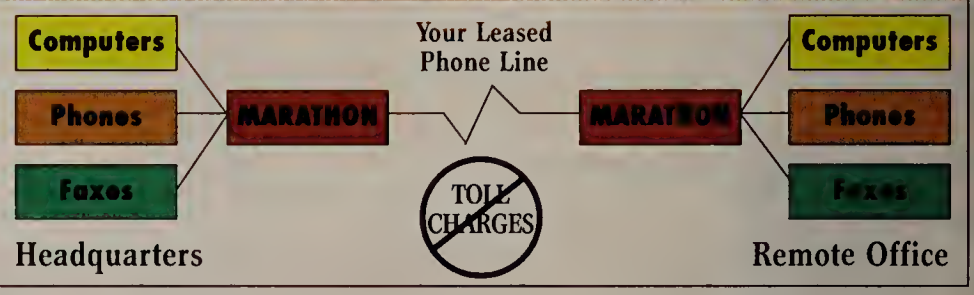

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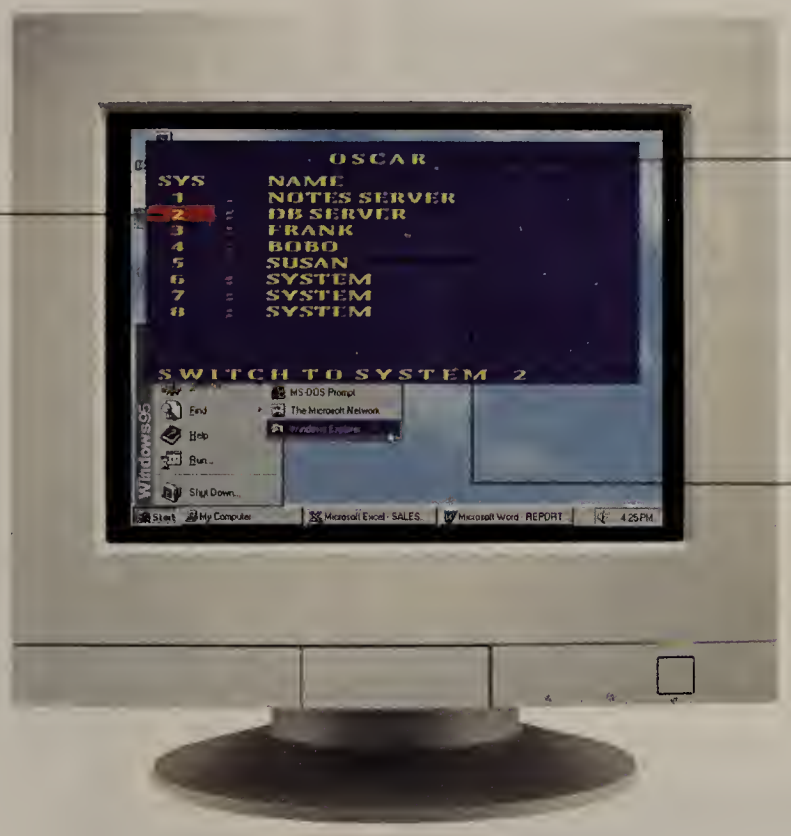

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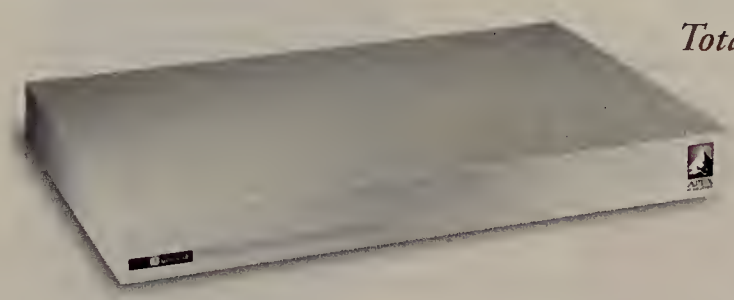

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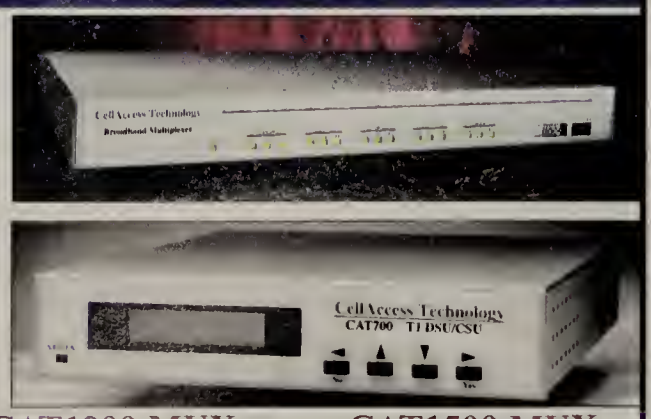

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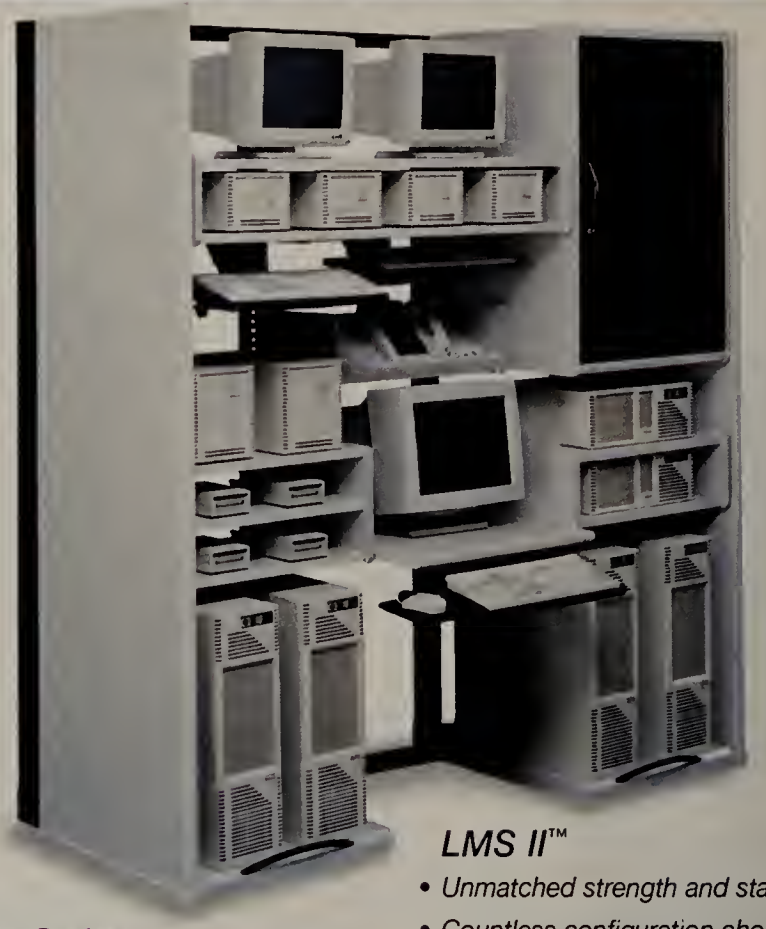

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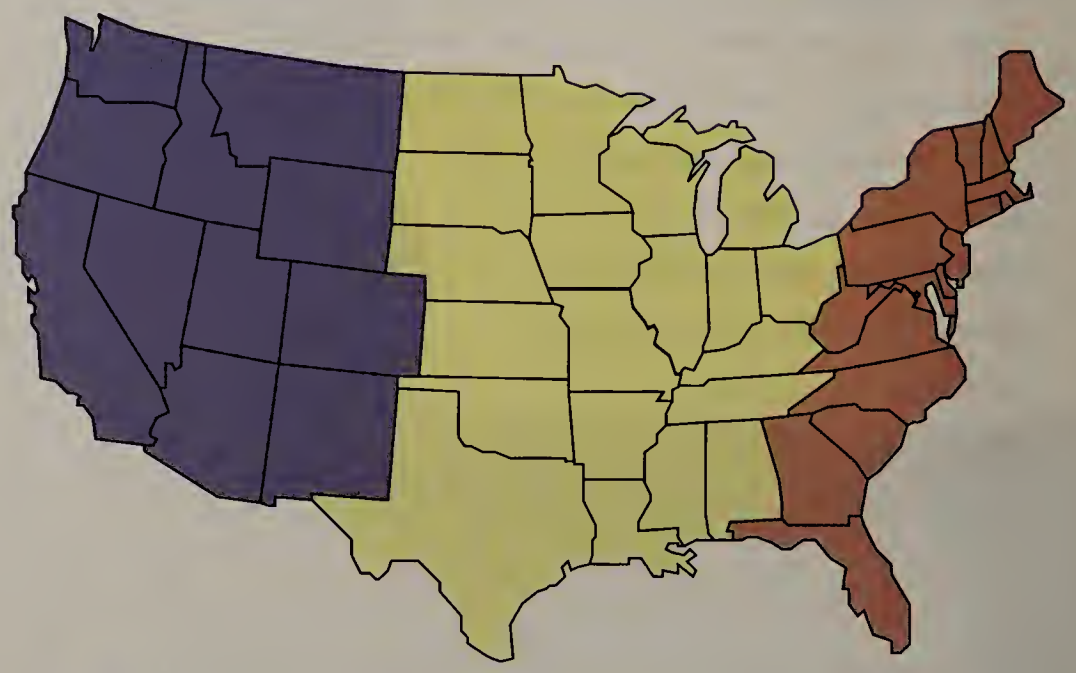

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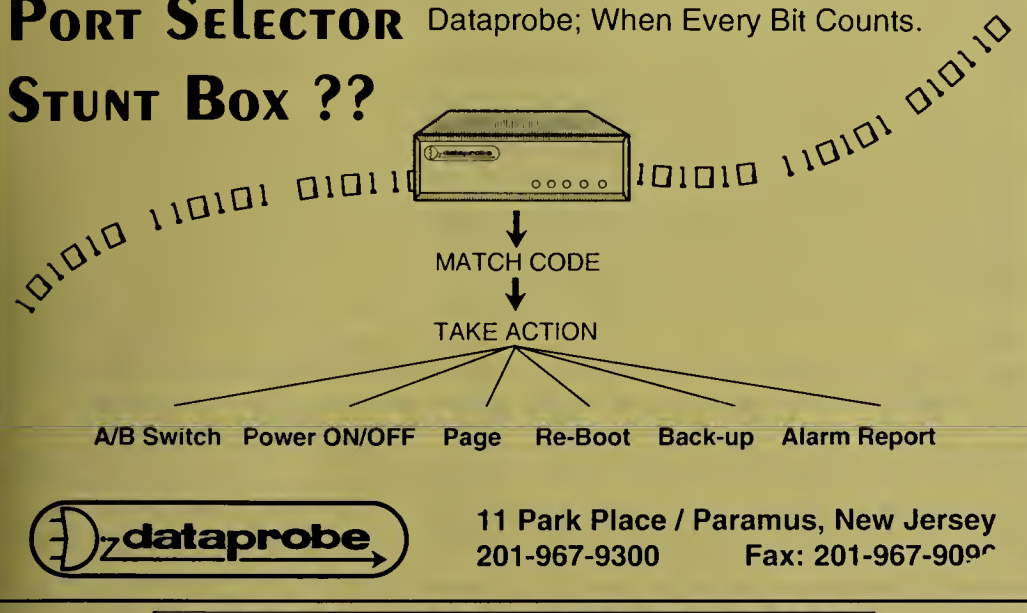

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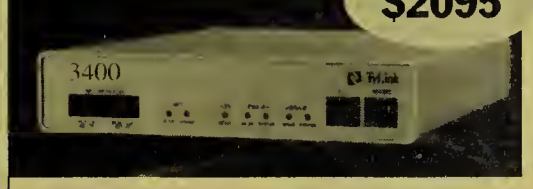

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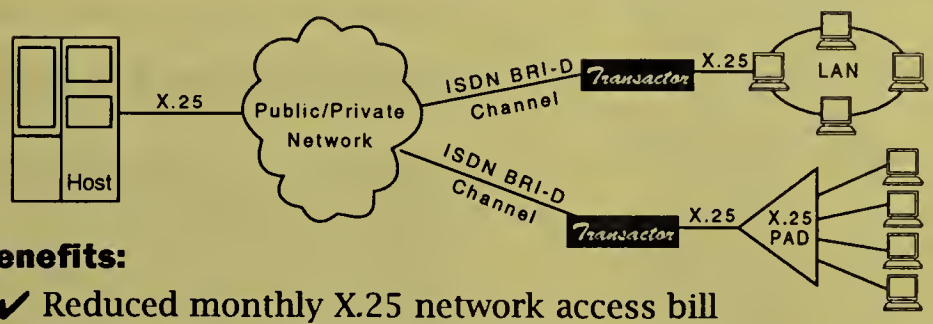

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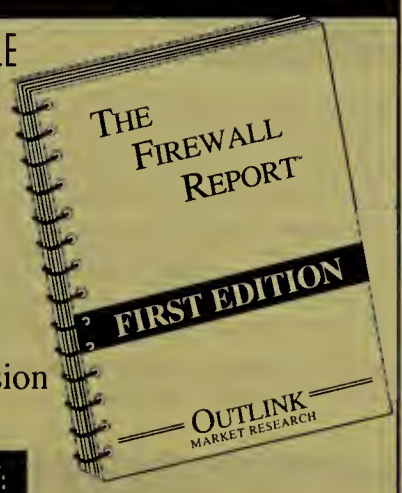

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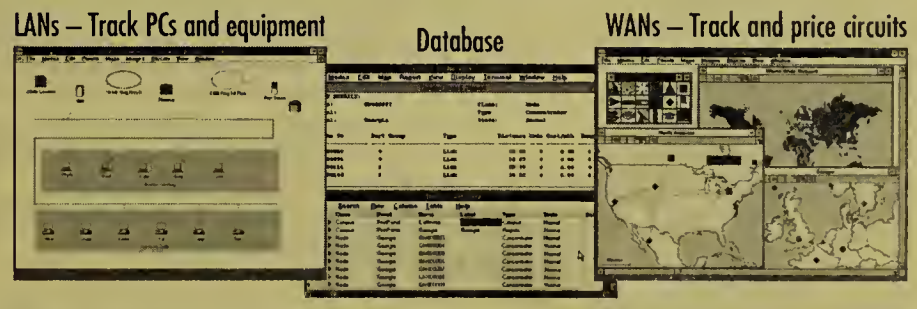

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Cisco

Continued from page 1

at Great-West Life and Annuity Co. in Englewood, Colo. Varey, who uses Cisco's Catlyst 1200 switches and is evaluating the 3000s, said Cisco has not disclosed how it will deal with the RMON differences.

Observers say Cisco's strategy lacks the consistency and comprehension of the RMON and RMON2 plans of rivals Bay Networks, Inc. (*NW*, Sept. 25, page 1) and 3Com Corp. They also note that 3Com's recent alignment with Axon might force Cisco to migrate Catalyst 3000 users to Frontier gear.

Cisco seems to lean that way.

"We're in the process of working out a strategy to focus on a single set of [RMON] products" for Catalyst switches, said Ben DeBolle, a Cisco product manager. "We have to be sensitive to customers out there who have existing products. Once we have all of these products available, then I'll be in a position to actually provide a migration path."

Falling victim

Analysts say Cisco's RMON plan has fallen victim to the company's buying binge. "These product lines they have acquired really aren't integrated yet," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The Grand Junction switches, for example, contain a private Management Information Base (MIB) that provides per-port statistics, DeBolle said. Users have to figure out when to use RMON and when to use the private MIB for gathering data from those switches, he said.

As for the LightStream ATM switches, Cisco is looking at adding RMON or RMON-like capabilities, but DeBolle said it is too early to discuss a strategy.

In the meantime, Great-West's Varey would also "love to see" RMON agents in Cisco's 2500 routers, but the vendor has not discussed plans to add RMON to them. Cisco officials say they will disclose an RMON strategy for routers in early 1996.

And that's about the time Cisco will deliver much of its RMON gear. Under the Frontier deal, Cisco will offer Frontier probes for fast Ethernet, FDDI, token-ring and Ethernet links under the name SwitchProbe.

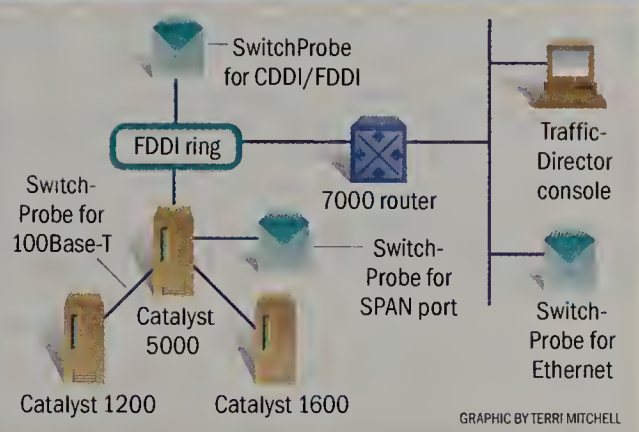
Cisco will also offer a SwitchProbe that connects to a switch port so traffic flowing through specific ports can be monitored in more detail. In addition, Cisco will provide Frontier's NetScout Manager application under the name TrafficDirector for graphical depiction of net behavior.

Cisco plans to equip its switches with RMON2-compliant agents next year. SwitchProbes will be available in December at prices ranging from $3,500 to $19,000. TrafficDirector will be available in first-quarter 1996 at prices ranging from $3,000 to $5,000, DeBolle said.

✆Cisco: (408) 526-4000.

Exploring the management frontier

Cisco will resell Frontier's probes, RMON agents and analysis applications under the SwitchProbe and Traffic-Director brand names, enabling customers to perform detailed analysis of their switched internets.



GRAPHIC BY TERRI MITCHELL

MCI

Continued from page 1

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KEYS TO THE MOVE

- Doing custom programming on standard DCE applications to fit specific needs
- Adapting DCE applications to run more efficiently on multiprocessors
- Testing DCE packages from multiple vendors to ensure interoperability
- Working closely with engineers at DCE vendors

The Open Software Foundation, Inc.'s DCE — a collection of security, directory and communications technologies that let unlike computer systems share data, processors and applications — has done the trick.

The long-haul carrier's conversion to DCE-based applications has helped customer service reps cut in half the time it takes to complete transactions and has made it easier to track customer service calls companywide. Also, MCI has used DCE tools from IBM and Digital Equipment Corp. to build over a span of 10 months applications for telemarketing, credit card authorizations and tax services.

"We wanted to build and distribute applications easily and rapidly," Arnold said. "There really was no other technology that could do what DCE promised and now delivers in a real live production environment."

MCI has made particularly good use of two central DCE components: remote procedure calls (RPC) and Cell Directory Service (CDS).

RPCs provide the standardized communication links between clients and servers that support DCE applications. The CDS defines all files and authenticated users in a DCE network, or cell, enabling the RPC calls to get to their proper destination.

For example, end users invoking the new customer service application can kick off multiple RPC calls to servers across the MCI cell. The CDS directs the calls and routes the data back to the customer service representative's desktop.

"Now customer service reps can gather information from one server, obtain credit authorization from a server at the bank, track customer profiles from another server and have all that information appear on an integrated screen simultaneously," Arnold said.

One reason the new applications run so fast even though they are distributed nationwide is that DCE programs are multithreaded. That means they can be broken down into many small tasks that one or more servers can run simultaneously.

Getting with the program

While DCE is making life easier for MCI customer service reps, it is by no means a simple technology to deal with from a programmer's perspective, according to Arnold.

"DCE applications do a lot of caching internally, which initially pushed our CPUs to about 95% utilization. But we've cut that figure by a factor of 10 since the initial rollout," Arnold said. "We had to do a lot of reprogramming to make sure the cache would empty quicker and would refresh faster.

"If I had to do it again, I'd make sure everyone on our group got DCE training," Arnold said. "We had five people working on one application, and none of us had any training."

Despite that, DCE proved not impossible to use for deploying new applications since it works independent of underlying communications protocols. MCI's applications are running over a TCP/IP and DECnet backbone, which consists of a T-1 mesh network supported by Cisco Systems, Inc. 7000 routers.

"We didn't want to address the routers, TCP/IP or DECnet [during the application development process] because it was too complex and costly," Arnold said.

Complexity, however, was not entirely missing. Among other things, MCI had to deal with integrating DCE applications running across a variety of operating systems, including Windows, OS/2 and Digital VMS. ■

3Com

Continued from page 1

rings — possibly via full-duplex, 32K bit/sec links — and feature a 100M bit/sec FDDI uplink useful for tying in servers or providing a backbone connection.

The device will likely sell for about $800 per port, although pricing was not settled at the time sources were briefed.

Analysts said a homegrown switch could be a real asset for 3Com in competing with rivals, such as Cisco Systems, Inc., Bay Networks, Inc. and Cabletron Systems, Inc., that are marketing token-ring switches they have either bought or borrowed. "There'll be a very tight integration story behind this, inherent management features and capabilities the others are struggling to integrate into their offerings," said Katherine Korostoff, president of Sage Network Research in Natick, Mass.

3Com would not comment on its plans.

3Com has forged itself into a one-stop network shop by snapping up Chipcom Corp. and other network vendors. Rumors were flying that the company would buy its way into the nascent token-ring switching market by acquiring Nashoba Networks, Inc. Such a deal would not only have hastened 3Com's arrival into the market, but also would have jolted rival Cabletron, which markets Nashoba's token-ring switch.

But Robert Rosenbaum, vice president of marketing and sales at Nashoba, said nothing was doing regarding a 3Com acquisition. "The best we can determine is that those rumors came from 3Com salespeople attempting to discourage potential end users from purchasing the Cabletron token-ring switch," he said.

3Com has traditionally focused on Ethernet, but last January it announced a comprehensive token-ring switching strategy, pieces of which have arrived a bit behind schedule. The Token Ring Switching Module (TRSM) for the LANplex 6000 hub shipped just last month, four months behind schedule. Some sources said the LinkSwitch-TR should ship by the end of this year, while others do not expect it until the first quarter of 1996.

"I don't think it makes any sense at all," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, a consultancy in Boston. "People interested in token-ring switching are going to companies like IBM or Centillion with a history in token ring. It isn't a technology you can offer as a sideline."

Other analysts noted that 3Com actually has about a three-year history in token ring, with the acquisition of Star-Tek, Inc. in early 1993. "They said their products would be based on internally developed token-ring silicon," said a 3Com competitor who asked not to be identified. "That adds a lot of credibility. You need customized silicon to build a token-ring switch that has any impact."

But just how much demand there is for a token-ring workgroup switch is unclear at this point. Ethernet workgroup switching is booming, but token-ring users don't face the same performance problems that have driven Ethernet switching out to end users. Token ring inherently avoids many of the congestion problems Ethernet switching solves, and thus far, token-ring switches have been aimed at the LAN backbone.

However, Val Sribar, program director at META Group, Inc. in Reston, Va., said, "You're starting to see segmentation creep farther out into the network. What you'll see develop in the market is the ability to deliver multiple tiers of token-ring switching. When you start building switched networks, you need the ability to scale both ways."

✆3Com: (408) 764-5000.

COMMENTS?

See "How to reach us" on page 5.

ATM

Continued from page 1

an individual-case basis. BellSouth Corp., Pacific Bell and US WEST, Inc. plan to offer it next year. NYNEX Corp. is the only RBOC holding off on ATM altogether until sometime next year.

On the long-distance side, MCI Communications Corp. and Sprint Corp. offer T-1 ATM now, AT&T plans to offer it by the end of the year and LDDS WorldCom by next spring.

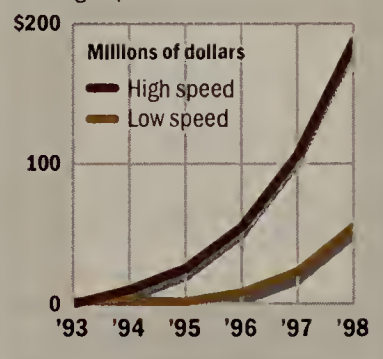
AT&T is confident enough of user demand to rush its service to market before T-1 user port cards are available from its switch vendor, StrataCom, Inc. An AT&T spokeswoman said the firm will use a workaround to deliver the service until the StrataCom cards are available at the end of the year.

For its part, StrataCom is bullish on T-1 ATM. In addition to the T-1 ATM interfaces, next year it will roll out support for inverse T-1 ATM multiplexing. The company view: Carriers are installing ATM backbones for their frame-relay nets, so give them as many ways as possible to deliver ATM, said Andrew Greenfield, StrataCom's product-line manager for ATM market development.

Big bandwidth means big money

Figure 1

Although the market is waking up to the demand for T-1 ATM, the bulk of service revenues will ultimately come from high-speed services.



SOURCE: VERTICAL SYSTEMS GROUP, OEDHAM, MASS.

T-1 gives net managers more ATM deployment flexibililty, saving them from having to justify a 155M bit/sec OC-3 link, he said.

US WEST, perhaps the most aggressive RBOC in marketing ATM, lacks a T-1 offering but is working on it. A panel of ATM users told the company T-1 ATM is their No. 4 priority.

Spokesmen for US WEST and Ameritech said they believe ATM demand would be driven by higher bandwidths than T-1 but recognize some users want less.

An AT&T spokeswoman put it this way: "Will the T-1 ATM offering increase the potential for that market to grow quicker? Probably. Is it necessary for the market to grow, period? No. It's just a matter of how quickly you would see the growth. Customers are saying, 'I just don't need that T-3. Can I get away with a T-1?' "

That falls in line with predictions that sales of T-1 ATM ports will outstrip sales of T-3 and OC-3 ports over the next three years (see Figure 1). But at the same time, revenues from the higher speed services will far outweigh revenues from T-1 (see Figure 2).

That has some vendors betting on high-speed ATM to carry their product lines. Ascom Timeplex, Inc., for example, is augmenting its multiplexers with ATM access devices but not at T-1. "Our customers are interested in the higher speeds," said Hava Zernik, a product manager for Ascom Timeplex.

Zernik said Ascom Timeplex customers with leased-line networks have considered migrating directly to ATM, but most are now back to considering frame relay instead as a less expensive alternative.

"As long as you have competing technologies — ATM and frame relay — you won't see T-1 ATM take off," she said.

Beth Gage, broadband consultant for TeleChoice, Inc., a Verona, N.J.-based consultancy, acknowledged that frame relay is a stiff competitor with T-1 ATM, but pointed out that use of one doesn't preclude use of the other. "If you have frame-to-ATM service interworking, you can start to migrate the network to ATM starting with the central site without worrying about your remote sites until they need more bandwidth," she said.

Pricing pitch

While bandwidth and application needs help drive demand, price plays a major role. Carriers generally have priced ATM close to frame relay rates, and that is good from the network manager's perspective, Gage said.

"If you're trying to consolidate voice, video and data, then you go with ATM. If it's strictly data, then frame relay is always going to be a better choice," she said. ATM overhead — 10 times greater than that of frame relay — means lower throughput over the same size pipe, she said.

With the advent of T-1 ATM inverse multiplexing, users will be able to grow bandwidth gradually. But Thomas Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J., said that is of limited use. Pricing is such that after five to seven T-1 ATM connections, it pays to buy T-3 instead.

That made it worthwhile for Branch Banking & Trust Co. in Winston-Salem, N.C., to get OC-3 ATM connections between some of its offices, according to Dennis Breen, the bank's network services manager.

Breen said he would like to install T-1 ATM to more branches, but it is too expensive. The only way to get T-1 ATM from BellSouth is to have the carrier nail up an OC-3 line and pull 1.544M bit/sec out of its capacity. The installation and monthly line charges rule this option out.

"If I could get [ATM] into an individual premise at a lower rate, then I'd certainly use it," Breen said. As it is, Breen still has excess bandwidth on the OC-3 service into the bank's headquarters, and he'd like to do something with it.

Wyndham Hannaway, president of Wyndham Hannaway and Associates in Boulder, Colo., used ATM in a US WEST trial earlier this year but probably won't pursue it further until there is a T-1 option.

"What we see is two extremes — the power users at one end, who can never get enough bandwidth, and at the other end, the people who want to get into this because they know they're going to be there in the future but don't have the traffic today for T-3," Hannaway said.

Nolle agreed with that assessment. He expects every manager of a T-1 leased-line network to grapple with ATM within the next five years, and he said T-1 ATM is a way to ease into it.

"It's a given," Nolle said. "You many not be doing it on a large scale, and you many not be doing it totally, but you're going to be doing it somewhere." ■

ATM growth

Figure 2

The ATM market is projected to double next year and continue to make dramatic increases through 1998.

SOURCE: VERTICAL SYSTEMS GROUP

PeopleSoft

Continued from page 1

tion, which is middleware based on Open Software Foundation, Inc.'s Distributed Computing Environment (DCE). Connection encrypts user passwords across the network and gives users a single logon for databases and applications.

That interface, which will deliver more desktop security, is not due until late in the first quarter of 1996.

The security issues are particularly disconcerting because the PeopleSoft applications work with databases that contain an organization's most confidential and proprietary records.

For applications based on Oracle Corp. databases, PeopleSoft is expected to forge a deal to get some of the encryption technology in the Redwood Shores, Calif., database maker's SQLNet networking software, according to sources.

PeopleSoft, the No. 3 vendor of client/server applications, declined to comment on the plans.

PeopleSoft 5 is a suite of prebuilt financial, distribution and human resources applications. The security issues are particularly disconcerting because the PeopleSoft applications work with databases that contain an organization's most confidential and proprietary records.

These problems came to light in a recent report by First Albany Corp.-META Technology Research, a New York-based research investment firm, which slammed the applications vendor, based here, for several potential security breeches. In addition to the unencrypted password, the report also pointed out that PeopleSoft applications do not exploit all the security features that exist within its back-end databases from Oracle or Sybase, Inc.

PeopleSoft officials said a maintenance release that shipped last week minimizes the potential risks associated with storing a password in memory on the client.

"We have taken steps to encrypt and then destroy the password on the client in our maintenance release," said John Cate, PeopleSoft's director of public relations.

Although PeopleSoft admitted that some work needs to be done to boost security in its software, it insisted that users had no problems.

Indeed, several users were unaware of the security issues. Others who knew of the possible glitches were not too concerned.

"For us, the fact that the password is stored in memory on the client is a nonissue," said John McCarthy, security manager at Toronto's York University, which runs PeopleSoft financial and human resources applications.

Of greater concern to McCarthy is the fact that passwords are sent unencrypted over the net. "Being a university, we have users who want to experiment," McCarthy said. ■

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Back to Reality

Networking industry could be gagged by anti-immigration bogey

I was famished, waiting in line recently to buy a slice of pizza. Oblivious to the line was a mob of Guess jeans-clad teenagers and moms, jabbering in a foreign language usually not heard within 10 time zones of America. The only word I recognized was "pizza."

My stomach was glad when they finally jabbered off down the hall. So was the kid serving pizza. He was relieved no one had asked for pepperoni and mushrooms. We might have waited all day for a translator.

Immigrants, English-speaking or not,

David J. Buerger

are part of America's heritage. They built this country. Most of our family trees include relatives who believed the foliage was greener in America. (It is, except in Newark, N.J.)

There's a legislative movement afoot, however, that aims to cut immigration. If enacted, the result could hamper growth in the network and electronics industries. It could also inhibit development of products designed to give your business an edge (or give you job security figuring out how to install and run the darn stuff).

Sound far-fetched? Read on.

Reacting to populist fears that foreigners on temporary visas are unfairly stealing "good" jobs from American workers, Alan K. Simpson (R-Wyo.), chairman of the Senate Immigration subcommittee, has proposed to limit H-1B visas. These visas allow employers to sponsor "specialty occupation" foreign nationals to work in the U.S. He wants to chop this group from 140,000 to 75,000. About one-fourth of these requests last year were for computer-related workers.

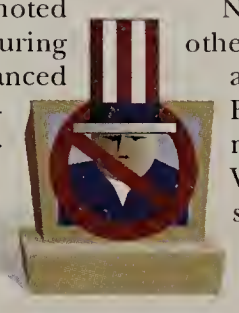
Simpson also wants business sponsors to pay new "taxes" to discourage hiring foreigners in the U.S. Wages for foreign nationals would be 10% higher than those of U.S. workers, plus 30% of the foreign national workers' annual compensation would go to a fund for retraining Americans. Ouch.

Being a skeptical kinda guy (Can journalists ever trust politicians?), I decided to poll several network, electronics and software companies to gauge Simpson's the-sky-is-falling assertion.

I learned that the industry hopes Simpson will take his proposal and stuff it in the Senate's cloak closet.

Foreigners working in the U.S. for companies such as Bay Networks, Inc., 3Com Corp. and Intel Corp. make up less than 1% of total head count. Microsoft Corp. clocked in higher: About 5% of its 12,000-person U.S. workforce has a visa. (It figures — Seattle is really green.)

Tom Waldrop, a spokesman for Intel, said, "We are hiring talent." He noted that of the 4,000 people hired during the first half of 1995, 300 had advanced degrees in electrical, mechanical, computer and chemical engineering, or material science. About 100 of those workers have visas.



"Those 100 people are a critical part of our workforce," he said. "We're quite concerned about the proposed legislation because it could prevent us from moving certain project teams forward." He said some slots can be filled only by a handful of people in the world.

The shortage is caused by the failure of Americans to earn advanced technical degrees. A National Science Foundation report states that foreigners constituted 49% of the Ph.D.s in computer science during 1993, up from 36% a decade before. (I guess American graduates are searching for their kind of green in places like Wall Street.)

Engineers in other parts of the world are plugging the gap. A good example is in Bangalore, located in South India.

India is a poverty-stricken place jammed with 900 million people, many of whom fill charming Oriental bazaars and swim naked in filth called the Ganges River.

The population density is 693 people per square mile — all crammed into a space about one-third the size of the U.S.

No wonder some want out. But other entrepreneurs have stayed put and opened their own shops in Bangalore. This mecca for technoids rivals talent found in Silicon Valley and on Route 128. The skilled locals are fluent in English and comfortable with Yankee chic, making this a sacred hunting ground for big American employers scouring the globe for increasingly hard-to-find talent.

But if Simpson's legislation makes it to President Clinton's desk, it will be harder for domestic firms to turn to Bangalore and other talent treasure troves.

(The ban on decent encryption software could also compromise plans to start foreign shops and E-mail work back to the states. Thank Uncle Sam for the jam.)

National borders are becoming less relevant, thanks to network technology. People like Sen. Simpson should stop their jabbering and let the electronics industry — by far the nation's largest gainful employer — get on with its work.

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.

CyberSpeak

Voices from the reader network

NEXT QUESTION

Is there a need to upgrade to Pentium Pro machines right away?

Responses due by 8 p.m. Thursday, Nov. 16. You'll get a T-shirt if we print your response. Please include your name, title, company and address.

Is Cisco stretching itself too thin with all its acquisitions?

"Cisco has acquired an awful lot of different products, and how well they can meld it together remains to be seen. They certainly have a challenge ahead when it comes to integrating the acquired companies with their own operations. But if Cisco lets the acquired companies benefit from its deep pockets while allowing them to progress on their own, Cisco has a better chance of being successful."

Jerry Zickrick, director of internal Information systems, ProBusiness, Inc., Pleasanton, Calif.

"No. Cisco, by gobbling up smaller companies, can effectively walk in and say, 'You will do it this way, here's our support structure, here's how we go about it.' There's really a lot fewer questions [compared to merging with a big company as Bay Networks, Inc. and 3Com Corp. have done]."

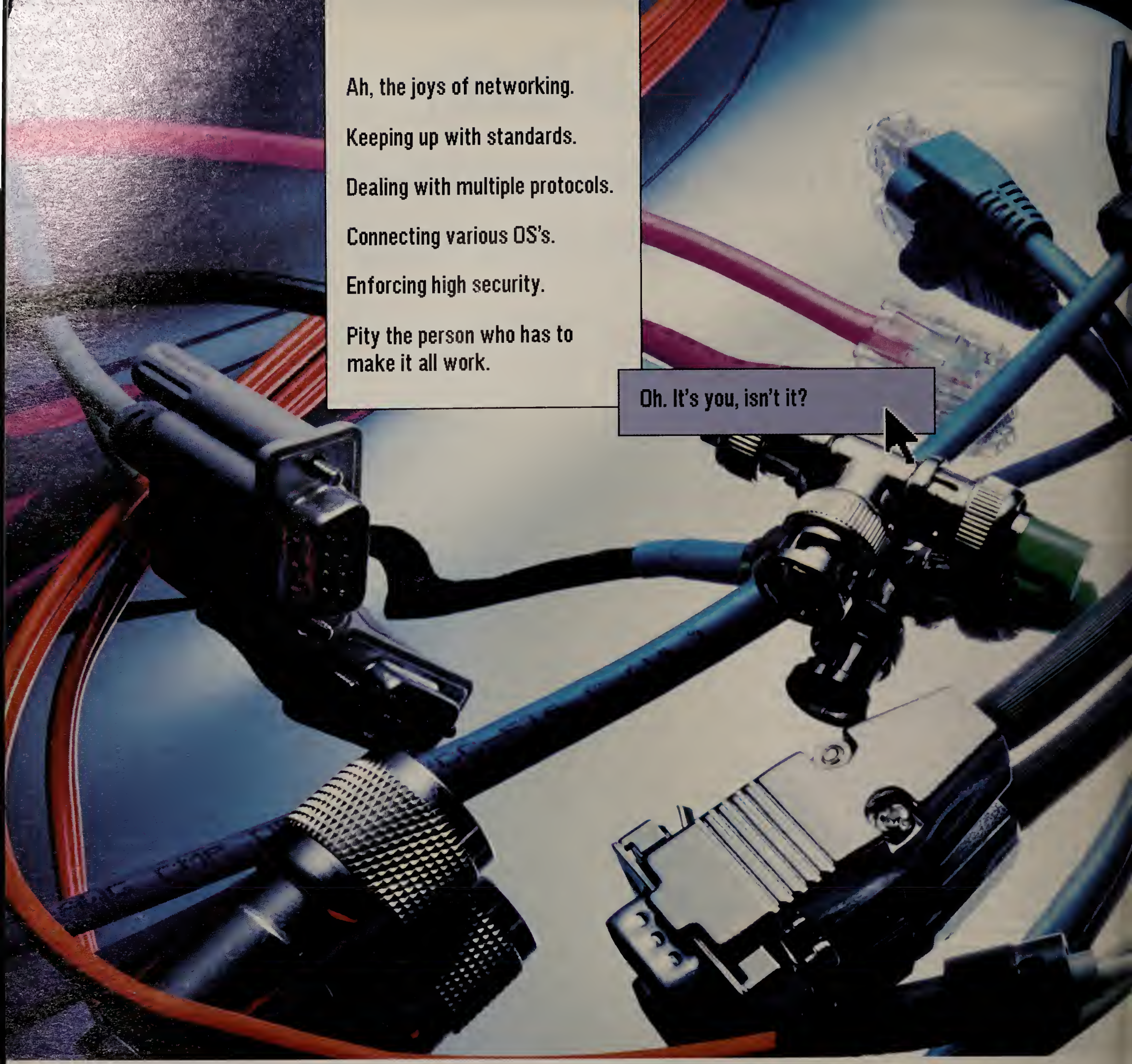
Allen Hsu, systems support team leader, Phoenix Newspapers, Inc., Phoenix

"For the most part, the acquisitions have been positive for both Cisco and its customers. However, I'm still trying to figure out the Grand Junction acquisition.

"Cisco's biggest challenge will be integrating all the various network management applications into CiscoWorks. But to date, I haven't seen any evidence of them spreading themselves too thin."

Donald Varey, senior network specialist, Great-West Life and Annuity Co., Englewood, Colo.

NEXT WEEK: Don't miss Abend, our back-page column that alternates with CyberSpeak and brings you humorous items, oddities, marginalia and other insights from the Internet and elsewhere. Send items to network@nww.com or get in touch with us any other way listed on page 5.



[Can your network do this?]

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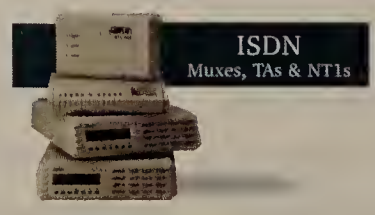

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